Rainbow of chaos

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RAINBOW OF CHAOS

A STUDY INTO THE THEORY AND PRACTICE OF INTEGRATED PRIMARY CARE

Pim P. Valentijn

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RAINBOW OF CHAOS

A study into the theory and practice of integrated primary care

EEN REGENBOOG VAN CHAOS

Een onderzoek naar de theorie en praktijk van de geïntegreerde eerstelijnsgezondheidszorg

Proefschrift

ter verkrijging van de graad van doctor
aan Tilburg University
op gezag van de rector magnificus,
prof.dr. E.H.L. Aarts,

in het openbaar te verdedigen ten overstaan van een
door het college voor promoties aangewezen commissie
in de aula van de Universiteit
op woensdag 16 december om 16.15 uur

door
Pim Peter Valentijn
geboren op 13 juni 1982
te Enschede

PROMOTIECOMMISSIE

Promotores

Prof.dr. H.J.M. Vrijhoef

Prof.dr. D. Ruwaard

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Prof.dr. P.L. Meurs

Prof.dr. H.L.G.R. Nies

Prof.dr. J. De Maeseneer

Prof.dr. D.H. de Bakker

Dr. N. Goodwin

So, oft in theologic wars
The disputants, I ween,
Rail on in utter ignorance
Of what each other mean,
And prate about an Elephant
Not one of them has seen!

The blind men and the elephant
In: The poems of John Godfrey Saxe
John G. Saxe (1816-1887)

CONTENTS

CHAPTER 1

GENERAL INTRODUCTION

GENERAL INTRODUCTION

The future sustainability of healthcare systems is currently one of the most widely discussed and controversial issues. Healthcare systems are challenged by an ageing population, an increase in the number of people diagnosed with chronic diseases and major pressure on public finances to reduce ever increasing healthcare expenditures [1, 2]. At a global scale, these developments are forcing policymakers to reform healthcare systems in order to deliver more and better health services with less human and financial resources. More recently, the global economic crisis has forced governments to even further cut health budgets and to introduce efficiency-enhancing reforms [3]. In an increasing number of countries, integrated care has become a central part of policy initiatives to enhance the sustainability and affordability of their healthcare system [4-6]. Moreover, primary care is considered the central hub for integrating various health and social services, and has proven to be essential in terms of effectiveness and efficiency [6, 7]. Primary care provides patients their first contact with professional healthcare, facilitates access to other health and social services and coordinates care for those with complex needs [7, 8]. Integrated primary care services are considered an essential driver in the shift from expensive in-hospital care towards ambulatory and preventive care [6, 9, 10].

The drivers for integrated care

A particular demographic transition has become alarmingly relevant to the implementation of strong and integrated primary care services – the increased frequency of multi-morbidity [11]. Research suggests that multi-morbidity already represents 50% of the burden of disease in most Organisation for Economic Co-operation and Development (OECD) countries [12, 13]. It is clear that the challenge of curing patients suffering from more complex and multiple problems and illnesses is not likely to be accomplished by means of the traditional approach to healthcare which focuses on individual diseases [11, 14, 15]. Healthcare systems need to evolve a more comprehensive and integrated perspective on service delivery accompanied by a dissolution of boundaries between social, primary, secondary and tertiary care. The merits of a more integrated approach are evident as controlling diseases one-by-one leads to fragmented chains of command and funding mechanisms, duplicated supervision and training schemes and multiple transaction costs [5, 6, 16, 17]. Likewise, evidence points out that environmental hazards as well as lifestyle and social factors have far more influence on improving the overall health of complex populations than access to health and care services [6, 18-20]. The recognition of the multiplicity of influences on health as well as the variability in vulnerability and resiliency of different individuals and subpopulations are explicitly described in the person-focused and population-based health principles of primary care [6, 16, 21, 22]. Care that is person-focused and population-based takes into account the physical, emotional and social aspects of life as well as the specific socio-political context that influences health and well-being. This means that healthcare services along with medical criteria have to consider person-defined needs and priorities along with addressing the complex illness burden of a defined population. As William Osler stated [23]: "It is more

important to know what sort of patient has a disease than what sort of disease a patient has." This reconfiguration also refers to the ability of people to contribute to their own health through lifestyle, behaviour and self-care, and by optimally adapting professional advice regarding their life circumstances. Empowering people to take control over their own health is critical to improving the efficiency of care as countries deplete their human and financial resources in the attempt to adequately address the rising burden of disease. In recent years, this focus on empowerment has led to a renaissance of the person-focused and population-based health values of primary care, that, for example, is also expressed in the recently proposed concept of health [24]. The changes in demography and increase in multi-morbidity are unequivocally pointing to the need for a more holistic approach rather than a disease-focused approach to address the rising burden of healthcare within society.

Challenges towards integrated primary care

Primary care, as stated in the Alma-Ata declaration of 1978 [25], explicitly endorses the organisation of services around the human and population dimensions of health. In addition, primary care aims to integrate different health and social services through inter-sectorial collaboration, which includes inter-organisational as well as inter-professional collaboration, across multiple settings. Yet, Alma-Ata's broad vision lacks a clear implementation plan and has failed to generate a clear and practical consensus on how to develop and effectively implement such integrated services [26]. Apart from that, the establishment of this type of integrated (primary) care service is hampered as a result of an episodic medical orientation, specialisation, differentiation and silo mind-sets among the many aspects of healthcare systems (e.g. policy, regulation, financing, organisation and professional and organisational culture) [5, 6]. The absence of a conceptual framework and robust strategy to integrate services from a primary care perspective highly impede the systematic understanding necessary to undertake program implementation, policy formulation and research. Increasingly, scholars argue that integrated care can be an important strategy for moving beyond the conceptual dissonance in primary care and ultimately lead to the delivery of health services promised by Alma-Ata [4, 26, 27]. Consequently, in order to facilitate program implementation, policy formulation and research, there is a growing need for a theory-based framework that explains what integrated care is from a primary care perspective.

The integrated care strategy

However, integrated care, like primary care itself, is described as being akin to the biblical Tower of Babel built upon numerous vague and confusing terms and concepts [28]. For example within the literature, integrated care is called "managed care," "coordinated care," "continuity of care," "comprehensive care," "collaborative care," and "transmural care" [5]. Integrated care, as defined by Singer et al. (2011) [29], can be described as care that is coordinated across multiple professionals, organisations, and sectors and attuned to patients' needs and preferences [30]. Within the context of the multiple meanings and approaches to integrated care, it is difficult to compare research findings and insights across studies and to identify the enablers needed to

achieve the desired outcomes of integrated care intervention[31-33]. This conceptual inconsistency hampers a systematic understanding and poses significant challenges for policymakers, commissioners, managers, professionals and researchers to support the effective deployment and evaluation of integrated care efforts in practice [31, 34]. Increasingly, scholars have called for the establishment of a common terminology and typology to facilitate program implementation, policy formulation and research [5, 33, 34].

Prominent integrated care models that exist today (e.g. Kaiser Permanente and the Mayo Clinic) were originally developed in the 1980s in the USA as a means for improving efficiency and quality of care by bringing together various services and organisations under a large, singularly owned, centralised structure [35]. Many of these early integrated care efforts were grounded on industrial-quality improvement logic aimed at standardising the delivery of care based on top-down control strategies of change [36]. This linear structure-process-outcome conceptualisation of integrated care is reflected in many traditional models in the literature [37]. Criticism is directed towards researchers for not commenting on the multifaceted factors that contribute to the success or failure and the nonlinear dynamics inherent in the integration process [35, 36, 38-40]. It is suggested that the meaning of concepts such as "health," "primary care," and "integrated care" lack rigid boundaries and change in relation to their context, time and the nature of the healthcare problem [5, 24, 35, 37, 41]. Existing integrated care models tend to overlook the inherent multifaceted nature and dynamic complexity of providing integrated care. The literature also suggests that structural top-down strategies and modifications at the organisational and political level (e.g. funding, governance and accountability) are insufficient to encourage widespread implementation of integrated care [35].

Attempts have been made to address this gap through the understanding of integrated care as a process-centred bottom-up approach with an emphasis on reflection, self-organisation and collaborative learning [35, 37, 39]. The underlying assumption is that effective integration strategies are linked to social relationships in which people interactively assign, re-interpret and re-negotiate their identities and values [33, 36, 39]. Especially from a primary care perspective, this bottom-up integration approach is considered vital because primary care services have traditionally been delivered in disjointed mono-disciplinary small-scale practices [42].

However, the shift in relative emphasis from structural top-down to operational bottom-up integration strategies does not imply that top-down strategies and modifications at the organisational and political level are unnecessary. Several authors highlight the need to seek alignment of both top-down (e.g. policy and organisational) and bottom-up (e.g. clinical and operational) interventions based on their integrative potential [5, 31, 33, 35, 43]. The literature suggests that numerous political, financial, geographical, technological, inter-organisational, and inter-professional factors influence the development of effective and sustainable integrated services [5, 44]. There is, however, no comprehensive framework which identifies the specific factors that drive the integration of services at the micro, meso and macro levels within a healthcare system. Likewise, frameworks that have shed light on these factors lack a primary care perspective that is based on encompassing inter-sectorial collaboration, including an inter-organisational and

inter-professional collaboration approach with a distinct community and socio-political focus. This gap highlights the need for the development of a multilevel evaluation framework that can be used to classify a broad spectrum of integrated services.

The collaboration imperative

Inter-professional collaboration, as well as inter-organisational and sometimes even inter-sectorial collaboration as applied in practice, are widely used as a means to provide integrated care [33]. As stated in the Alma-Ata declaration of 1978 [25], primary care is a sector with a strong inter-professional, inter-organisational and inter-sectorial collaboration character. Although much of the literature on integrated care and primary care highlights the roles of inter-professional, inter-organisational and inter-sectorial collaboration, the concepts have rarely been applied either theoretically or empirically [45-49]. Within integrated care studies, the collaboration process towards integrated care is often evaluated as a "black box," with little understanding of the critical mechanisms for success or failure[33, 45]. There is considerable uncertainty surrounding whether and under what conditions all stakeholders (e.g. healthcare professionals, managers, and policymakers) involved within an integrated primary care setting will collaborate [10, 50]. Subsequently, conclusions about what works under which conditions are difficult to infer, and so is the extent to which lessons can be drawn. Such knowledge, however, is of utmost importance, as collaboration processes are often described as time-consuming, resource intensive, and fraught with challenges [51-53]. Especially in the health and social care sector, collaboration approaches tend to have high and often early failure rates [51]. In conclusion, this knowledge gap highlights the need to identify the underlying collaboration processes in order to better understand how integrated primary care services can successfully be established and maintained.

Aim and scope of this thesis

The knowledge gaps concerning integrated primary care are reflected in the title of this thesis, Rainbow of Chaos, which refers to the quotation of Paul Cézanne, the French Impressionist painter: "We live in a rainbow of chaos." His work preluded the beginning of modern 20th century painting and is noted for its ability to reflect a balance between "logique" and "optique" (i.e. order and chaos). This thesis aims to reveal that, like the work of Cézanne, the 'art' of implementing integrated primary care involves modulating its complexity without ending up in total chaos or restricted within unyielding boundaries. The overall aim of this thesis is provide a better understanding of what integrated primary care is, and how it can be achieved by focussing on the collaboration processes that underlie the development of integrated care in a primary care setting. The two overall research questions of this thesis are:

1. What is integrated care in the context of primary care?
2. What is the role of collaboration in the development of integrated primary care?

Research design and methods

Given the different nature of both research questions, varied methods were used to answer them. To address the first research question, a theory-driven, qualitative and mixed-method approach was used to operationalise the concept of integrated primary care. This approach was chosen as it allowed the exploration of why and how integrated care might work in a primary care context across a heterogeneous mix of literature and research disciplines [54]. Subsequently, Delphi studies with interdisciplinary panels of experts from academia and practice were applied to validate and operationalise the preliminary findings.

The second part of this thesis used data that were collected from 2010 to 2013 among projects that were part of a national integrated primary care study in The Netherlands [55]. Results of this formative evaluation study were used to explore the projects' collaboration processes and integration arrangements. Mixed-methods consisting of semi-structured interviews with key stakeholders, document analysis and questionnaires surveying professionals and managers were applied. For details on the individual research methods and study design, please refer to the corresponding chapters within this thesis.

Outline of this thesis

Part I of this thesis concerns the development, refinement and validation of a framework that specifies the concept of integrated primary care. ***Chapter 2*** introduces a conceptual framework which combines the concepts of primary care and integrated care by drawing on existing theory from the literature. This conceptual framework serves as a guide to better understand the complex nature of integrated primary care. ***Chapter 3*** describes the development of an initial taxonomy that specifies the key features of integrated primary care based on the framework of Chapter 2. As a first step towards a consensus-based taxonomy of key features, a Delphi study among experts from The Netherlands was conducted. In ***Chapter 4***, the taxonomy is further tested against international expert opinions to establish a common operational consensus regarding the concept of integrated primary care. **Part II** of this thesis describes the collaboration processes among the integrated primary care projects of the Primary Focus Programme in The Netherlands. ***Chapter 5*** explores how the development of collaboration processes is associated with the effectiveness of integrated primary care initiatives. ***Chapter 6*** explores how changes in collaboration processes relate to the degree of integration effectiveness. In the general discussion in ***Chapter 7***, the major findings of this thesis are summarised and discussed. Also limitations and recommendations for research, practice and policy are elaborated.

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PART I

THEORY: MODELLING INTEGRATED PRIMARY CARE

CHAPTER 2

UNDERSTANDING INTEGRATED CARE: A COMPREHENSIVE CONCEPTUAL FRAMEWORK BASED ON THE INTEGRATIVE FUNCTIONS OF PRIMARY CARE

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ABSTRACT

Introduction

Primary care has a central role in integrating care within a health system. However, conceptual ambiguity regarding integrated care hampers a systematic understanding. This paper proposes a conceptual framework that combines the concepts of primary care and integrated care, in order to understand the complexity of integrated care.

Methods

The search method involved a combination of electronic database searches, hand searches of reference lists (snowball method) and contacting researchers in the field. The process of synthesizing the literature was iterative, to relate the concepts of primary care and integrated care. First, we identified the general principles of primary care and integrated care. Second, we connected the dimensions of integrated care and the principles of primary care. Finally, to improve content validity we held several meetings with researchers in the field to develop and refine our conceptual framework.

Results

The conceptual framework combines the functions of primary care with the dimensions of integrated care. Person-focused and population-based care serve as guiding principles for achieving integration across the care continuum. Integration plays complementary roles on the micro (clinical integration), meso (professional and organisational integration) and macro (system integration) level. Functional and normative integration ensure connectivity between the levels.

Discussion

The presented conceptual framework is a first step to achieve a better understanding of the inter-relationships among the dimensions of integrated care from a primary care perspective.

INTRODUCTION

The aging population and the growing prevalence of chronic conditions increases the healthcare costs and utilization of many high income countries [1, 2]. Integrated health systems have been promoted as a means to improve access, quality and continuity of services in a more efficient way, especially for people with complex needs (e.g. multiple morbidities) [3-6]. Primary health care (as a set of principles and policies) and primary care (as a set of clinical functions) are considered as the corner stones of any health system (throughout this paper both 'primary care' and 'primary health care' are used interchangeable and referred as "primary care") [7-9]. Health systems built on the principles of primary care (first contact, continuous, comprehensive, and coordinated care) achieve better health and greater equity in health than systems with a specialty care orientation [9, 10]. The philosophy of primary care goes beyond the realm of healthcare and requires inter-sectorial linkages between health and social policies [7, 8]. Hence, the definition of primary care assumes an integrated view with the rest of the health system. However, in many high income countries integration of services is hampered by the fragmented supply of health and social services as a result of specialisation, differentiation, segmentation and decentralisation [5, 8, 11]. Fragmentation results in suboptimal care, higher cost due to duplication and poor quality of care [5]. In the Netherlands the Primary focus program aims to stimulate integration (both within primary care and between primary care and other health and social service sectors) by funding 70 collaboration initiatives [12]. To discover the critical factors that hamper or facilitate integration, starting from a primary care perspective, the development process of these collaboration initiatives is monitored. A conceptual framework is needed to make systematic and comparable descriptions of these initiatives. However, the concept of integrated care is ambiguous, since it is often used as an umbrella term that differs in underlying scope and value [4, 5, 13-15]. This lack of conceptual clarity hampers systematic understanding and hence the envision, design, delivering, management and evaluation of integrated care. There seems to be a growing need for a conceptual framework to understand the complex phenomenon of integrated care and to guide empirical research [13, 16]. The aim of this paper is to develop a conceptual framework for integrated care from a primary care perspective. In this paper we use the definition of integrated care of Leutz (1999) [17] and the definition of primary care as stated in the Alma-Ata Declaration [7], see table 1. This paper proposes a conceptual framework that can contribute to a better understanding of the concept of integrated care from a primary care perspective.

Table 1: Definitions of integrated care and primary care

Concept	Definition
Integrated care, Leutz (1999) [17]	The search to connect the healthcare system (acute, primary medical and skilled) with other human service systems (e.g., long-term care, education and vocational and housing services) to improve outcomes (clinical, satisfaction and efficiency)
Primary care, WHO Alma Ata Declaration (1978) [7]	Primary health care is essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination. If forms an integral part of both the country's health system, of which is the central function and main focus, and of the overall social and economic development of the community. It is the first level of contact of individuals, the family and community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first element of a continuing health care process.

METHODS

The framework was developed through an iterative process of: (1) a narrative literature review, and (2) group meetings and expert panels to synthesise the literature.

Literature search

We conducted a narrative literature review to identify existing conceptual and theoretical concepts regarding primary care and integrated care. The literature search involved a combination of electronic database searches, hand searches of reference lists of papers and contacting researchers in the field. We focused on the three concepts of the Primary focus program: (1) primary care; (2) integrated care; and (3) collaboration. The preliminary search started in the electronic databases Medline/PubMed, Cochrane Library and Google Scholar using the search terms 'primary care' and/or 'integrated care' combined with 'cooperation' or 'collaboration'. The following 'MeSH' terms were used to broaden the search in Medline/PubMed: 'Primary Health Care' and 'Delivery of Health Care, Integrated'. We included journal articles, books and book chapters written in English, that reported conceptual and theoretical concepts related to primary care, integrated care and collaboration. Potentially relevant references were further obtained from the retrieved publications and by contacting researchers in the field (snowball method).

Building the framework

The process of synthesising the literature was iterative. The lead author reviewed the literature, and catalogued the different conceptual and theoretical concepts. The research team chose the key features of primary care as a base on which to develop a more comprehensive framework. Next, we connected the ambiguous concepts of integrated care with the key features of primary

care into a first draft of the framework. To improve the content validity of the framework we discussed it with 7 researchers in the field of integrated care and primary care. During 6 meetings of approximately one hour a discussion was held on the synthesis of the essential elements of primary care and integrated care. Based on these discussions we refined the framework.

RESULTS

To construct the conceptual framework we used fifty articles obtained by our search. Eighteen were found by direct searches in databases and 25 by using the snowball method. We used 12 articles to identify the key elements of primary care and 34 articles to describe the key elements of integrated care. Table 2 shows the key elements of primary care and integrated care that we identified with our literature search.

Table 2: Key elements of primary care and integrated care

Concept	Key elements
Primary care (Adapted from Starfield (1992 and 2005) [10, 18]	**First contact care:** Implies accessibility to and use of services for each new problem or new episode of a problem for which people seek health care. **Continuous care:** Longitudinal use of a regular source of care over time, regardless of the presence or absence of disease or injury. **Comprehensive care**: The availability of a wide range of services in and their appropriate provision across the entire spectrum of types of needs for all but the most uncommon problems in the population. **Coordinated care**: The linking of health care events and services so that the patient receives appropriate care for all his/her health problems, physical as well as mental and social.
Integrated care (Adapted from Fulop (2005) [19], Leutz (1999) [17], Contandriopoulos (2003) [20] and Delnoij (2001) [21]	**Horizontal integration:** Relates to strategies that link similar levels of care **Vertical integration**: Relates to strategies that link different levels of care **System integration**: Refers to the alignment of rules and policies within a system. **Organisational integration**: Refers to the extent to which organisations coordinate services across different organisations. **Professional integration**: Refers to extent to which professionals coordinate services across various disciplines. **Clinical integration**: Refers to the extent to which care services are coordinated. **Functional integration**: Refers to the extent to which back-office and support functions are coordinated. **Normative integration**: Refers to the extent to which mission, work values etc. are shared within a system.

In the following sections, we will outline the pillars of our framework: (1) the key elements of primary care, (2) the dimensions of integrated care, and (3) the combination of the key elements of primary care and integrated care.

Integrative function of primary care

Primary care as stated in the declaration of Alma-Ata in 1978 is a strategy of public health (e.g.

a health policy at the macro level) derived from a social model of health, making it possible to distribute health services equitably across populations, see table 1 [7]. This philosophy contains a number of different concepts, namely: equity on the basis of need, first level of care usually encountered by the population, a political movement, a philosophy underpinning service delivery and a broad inter-sectorial collaboration in dealing with community problems. Taken together, a broad public health policy encompassing a wide range of integration functions and goals.

The functions of primary care (first-contact, continuous, comprehensive, and coordinated care, see table 2) [10, 18] make it possible to accomplish the integrated philosophy that is envisaged in the Alma Ata Declaration. Together these functions make primary care the starting point from where to improve and integrate care. The most evident function 'first contact' gives primary care a central position within the health system. It refers to the directly accessible ambulatory care for each new problem at all times and at close proximity of its users. The second function 'continuity' refers to the experienced coherence of care over time that addresses the need and preferences of people. Hereby the personal experience is essential, as continuity is what people experience. The third function 'comprehensiveness' refers to an array of services tailored to the needs of the population served. These services comprise curative, rehabilitative and supportive care as well as health promotion and disease prevention. The fourth function 'coordination' means that people are referred both horizontally and vertically when services from other providers are needed. All together, these functions give primary care a central role in coordinating and integrating care.

A person and population health-focused view

Enclosed in the functional conceptualisation of primary care is the person and population health-focused view. This holistic vision is expressed as person-focused and population-based care [7, 8, 10]. The first feature, person-focused care, reflects a bio-psychosocial perspective of health, as it acknowledges that health problems are not synonymous to biological terms, diagnoses or diseases [22]. It bridges the gap between medical and social problems as it acknowledges that diseases are simultaneously a medical, psychological and social problem [23]. Moreover, person-focused care is based on personal preferences, needs, and values (i.e. understanding the personal meaning of an illness). In contrast, a disease-focused view reflects a clinical professionals perspective, translating the needs of a person into distinct biological entities that exist alone and apart form a person. [24-26]. The second feature, population-based care, attempts to address all health-related needs in a defined population. In this view services should be based on the needs and health characteristics of a population (including political, economic, social, and environmental characteristics) to improve an equitable distribution of health (and wellbeing) in a population[10]. The need and equity focus of population-based care is especially important for socially disadvantaged subpopulations with higher burdens of morbidity [8]. Population-based care entails defining and categorizing populations according to their burden of morbidity. However, western health systems are dominated by the paradigm of an disease-focused view, that neglects the underlying causes of health and wellbeing [27]. This view is dysfunctional in a population, because a growing number of patients suffer from chronic and

overlapping health problems (e.g. multi-morbidity) [28]. Therefore, the person and population health-focused view is essential, as it recognizes that most health and social problems are inter-related. This is especially important in the context of integrated care as the person-focused and population-based perspective can link the health and social systems.

Dimensions of integrated care

The second pillar in our conceptual model are the dimensions of integrated care. This dimensions are structured around the three levels where integration can take place: the macro (system) level, the meso (organisational) level and the micro (clinical) level [29]. We start with drawing the contours of an integrated system at the macro level and then continue to the meso and micro level using the integrative guiding principles of primary care: person-focused and population-based care.

The macro level: system integration

At the macro level system integration is considered to enhance efficiency, quality of care, quality of life and consumer satisfaction [5, 6]. The integration of a health system is an holistic approach that puts the people's needs at the heart of the system in order to meet the needs of the population served (note the similarity to the definition of primary care) [4, 6, 13]. System integration requires a tailor-made combination of structures, processes and techniques to fit the needs of people and populations across the continuum of care [4, 5]. However, the current specialisation in health systems (e.g. disease-focused medical interventions) causes fragmentation of services threatening the holistic perspective of primary care [11]. A resultant of the specialisation and fragmentation is vertical integration (see table 2). Vertical integration is related to the idea that diseases are treated at different (vertical) levels of specialisation (i.e. disease- focused view). This involves the integration of care across sectors, e.g. integration of primary care services with secondary and tertiary care services. Contrary, horizontal integration is improving the overall health of people and populations (i.e. holistic-focused view) by peer-based and cross-sectorial collaboration [30]. Primary care and public health are characterized by horizontal integration to improve overall health [31]. The distinction between these integration mechanisms is important, because they require different techniques to be achieved and are based on different theories of change and leadership [30]. Nevertheless, both vertical and horizontal integration are needed to counteract the fragmentation of services in a health system[14, 16]. Incorporating vertical and horizontal integration can improve the provision of continuous, comprehensive, and coordinated services across the entire care continuum. In other words, partnerships across traditional organisational and professional boundaries are needed in order to improve the efficiency and quality of a system [32, 33]. In an integrated system these partnerships can pass through the boundaries of the 'cure' and 'care' sector to provide a real continuum of care to people and populations. Figure 1 shows an integrated health system with the person-focused care and population-based care perspective as the foundation for system integration. They serve as guiding principles within a system, which requires simultaneously horizontal (x-axis) and vertical integration (y-axis).

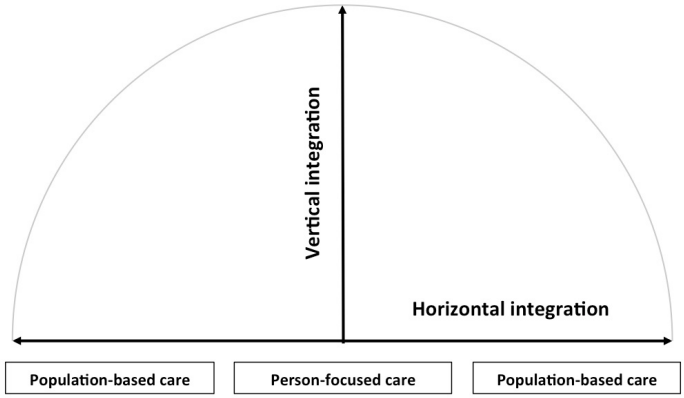

Figure 1: System integration

Meso level: organisational integration

One of the most discussed forms of integration is organisational integration, conceptualised at the meso level of a health care system [21]. Organisational integration refers to the extent that services are produced and delivered in a linked-up fashion. Inter-organisational relationships can improve quality, market share and efficiency; for example, by pooling the skills and expertise of the different organisations [3, 5, 16, 21, 34]. To deliver population-based care organisational integration is needed [16, 35]. The needs of a population require collective action of organisations across the entire care continuum (horizontal and vertical integration), as they have a collective responsibility for the health and wellbeing of a defined population. Especially in socially disadvantaged populations, such as those with large variations in wealth, education, culture and access to health care, the need for integration is high [5, 13]. However, the broad spectrum of organisations needed to assure good health in a population makes organisational integration complicated [5, 16]. For instance, health and social care organisations can differ distinctively in terms of culture, professional roles and responsibilities, and clinical or service approaches [13]. Furthermore, the differences in bureaucratic structures, levels of expertise, funding mechanisms and regulations can complicate organisational integration [36].

Market, hierarchy and networks

Organisational integration can be achieved through hierarchical governance structures or through market based governance structures between organisations [37]. Markets are more flexible than hierarchies, but the commitment between the organisations is minimal compared to hierarchies. Alternative for hierarchical or market based governance structures are network-like governance mechanisms, which means a more or less voluntary collaboration between organisations. They depend on relationships, mutual interests, and reputation and are less guided by a formal structure of authority [38]. Networks are considered as the golden mean

which unite flexibility and commitment. Network-like partnerships are prevalent in health and social care [5, 16, 39, 40], as these arrangements are able to address the opposing demands of state regulation and market competition present in many western health care systems. The extent of organisational integration is often expressed as a continuum, ranging from segregation to full integration [17, 41]. In a segregated situation every organisation is autonomous, with organisations functioning as independent entities. On the other hand, full integration contains hierarchical mechanisms of governance such as mergers and acquisitions. The intermediate levels of inter-organisational integration reflect the network-like governance mechanisms; linkage and coordination. The typology of 'loose' to 'tight' governance agreements is widespread in the literature [39, 42, 43]. Gomes-Casseres (2003) [44] describes a model that is similar to the continuum of organisational integration and ranges from market situations through inter-organisational network arrangements to mergers and acquisitions. His model states that the complexity of inter-organisational networks results from ambiguous shared decision making and unclear duration of commitment. In figure 2, the above mentioned theories of organisational integration and inter-organisational arrangements are combined.

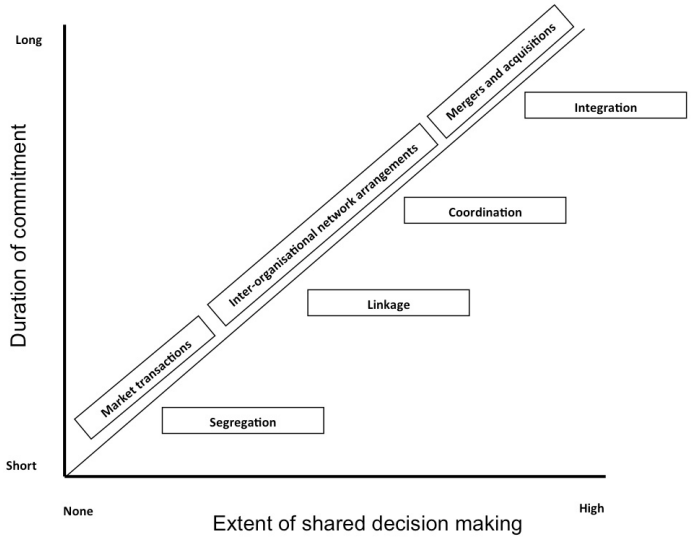

Figure 2: Continuum of inter-organisational integration. Source: Adapted from Gomes-Casseres (2003) [44] and Ahgren (2005) [41]

The left hand site of figure 2 shows a segregated situation, where market competition leads to contractual relations between the organisations. In this scenario, the duration of commitment and extent of shared decision making is short-term as a result of the 'invisible hand' of market competition [37]. The right hand site shows a full integrated situation, a top-down coordination

of organisations. In this scenario the duration of commitment and extent of shared decision making is long-term as a result of the 'visible hand' of a management hierarchy [37]. The central part of figure 2 shows a network mode of integration, and explains the complexity of this type of arrangements due to the continuous tension between flexibility and commitment. Within a network, management cannot exercise authority or legitimate power because each organisation retains its autonomy (reflected by shared decision making) [39]. This requires the involved organisations to continuously negotiate and assess the outcomes of the collaboration, resulting in an uncertain and changing environment (reflected by duration of commitment) [20]. Organisational integration in the field of primary care is often done according to a network mode [45]. This is, as most primary care organisations are not market oriented and many of them are not part of a common hierarchy [16]. However, these complex network arrangements require effective mechanisms of accountability and governance. Governance structures should align the different independent organisations and coordinate their interdependencies [6, 20]. To summarise, organisational integration contains several types of inter-organisational relationships on the meso level of a system that provide comprehensive services across the care continuum. Organisational integration is defined as follows: Inter-organisational relationships (e.g. contracting, strategic alliances, knowledge networks, mergers), including common governance mechanisms, to deliver comprehensive services to a defined population.

Meso level: professional integration

Professional integration refers to partnerships between professionals both within (intra) and between (inter) organisations [5], and is conceptualised on the meso-level of a health system [21]. These partnerships can be characterised as forms of vertical and/or horizontal integration. Professionals have a collective responsibility to provide a continuous, comprehensive, and coordinated continuum of care to a population [6, 21, 32, 46, 47]. Especially in populations with a growing burden of disease, professionals from a range of disciplines and sectors have to take shared responsibility for the integration of services to assure good health and wellbeing. Integration led by professionals creates combined responsibilities for commissioning services and promotes shared accountability, problem solving and decision making to achieve optimal health and wellbeing in a defined population [35]. As a consequence of this approach, the professional autonomy is affected and the traditional hierarchy and clear defined roles are blurred [48]. Professional integration can be achieved through a variety of arrangements from virtually integrated professional networks to fully integrated organisations[17, 49]. The extent of professional integration is expressed as a continuum similar to that of organisational integration (with fragmentation, linkage, coordination and full integration) [48]. Professional integration in primary care is traditionally characterised by network like arrangements, that create poor conditions for shared accountability [45]. Appropriate financing and regulation incentives can stimulate this [6, 32, 45, 50]. Besides the fiscal and clinical dimensions of accountability it is unclear what other types of accountability are required. However, a lack of shared language and divergent healing paradigms can make professional integration difficult. Clarity about

roles, responsibilities and principles of altruism, ethics, respect and communication seem to be crucial to overcome this difficulties[51]. The challenge is to stimulate accountable entrepreneurial professionals, while at the same time leaving sufficient freedom for different professional healing paradigms. We define professional integration as follows: Inter-professional partnerships based on shared competences, roles, responsibilities and accountability to deliver a comprehensive continuum of care to a defined population.

Micro level: clinical integration

At the micro level of a health system, clinical integration refers to the coherence in the primary process of care delivery to individual patients [21]. Clinical integration refers to the extent to which patient care services are coordinated across various professional, institutional and sectorial boundaries in a system [32]. Kodner [5] equates clinical integration with service integration: "coordination of services and the integration of care in a single process across time, place and discipline" [p.11]. In practice, clinical integration tends to be a disease-focused approach rather than a person-focused approach [52]. For instance, most tools and instruments of clinical integration are based on narrow, disease-oriented medical interventions [10, 52, 53]. The limits of clinical guidelines are increasingly recognized, particularly when the broader health context is involved, e.g. by chronic multi-morbidities [54]. This is particularly relevant for socially disadvantaged people (and populations) whose needs span a number of service areas. In practice, clinical integration requires a person-focused perspective to improve someone's overall well-being and not focus solely on a particular condition. Professionals have to take proper account of the needs of individuals, so that services provided are matched to their needs. This also encloses the important aspect of the patient as a co-creator in the care process; with shared responsibility between the professional and the person to find a common ground on clinical management [55, 56]. Emphasis should be placed on a person's needs, with people coordinating their own care whenever possible [14]. In other words, clinical integration based on a person-focused care perspective can facilitate the continuous, comprehensive, and coordinated delivery of services at an individual level. Our definition of clinical integration is as follows: The coordination of person-focused care in a single process across time, place and discipline.

Linking the micro, meso and macro level: functional integration

Functional integration supports clinical, professional, organisational and system integration [57]. It refers to mechanisms by which financing, information, and management modalities are linked to add the greatest overall value to the system [32]. Functional integration includes the coordination of key support functions such as financial management, human resources, strategic planning, information management and quality improvement [20, 35]. It involves shared policies and practices for support functions across partnerships between different actors within a system. However, functional integration does not mean more centralisation or standardisation [35]. Functional integration should be a flexible approach in order to enable partnerships to adapt to the constantly changing environment (e.g. population needs). One of the most important

aspects of functional integration is the linking of the financial, management, and information systems, around the primary process of service delivery (clinical integration) [35, 58]. These linked systems can support and coordinate policymakers (system integration), managers (organisational integration), professionals (professional integration) and patients (clinical integration) in their accountability and shared decision making in (inter-sectorial) partnerships. To sum, functional integration supports and links the clinical (micro-level), professional and the organisational integration (meso-level) dimensions within a system (macro-level). Functional integration is defined as follows: Key support functions and activities (i.e. financial, management and information systems) structured around the primary process of service delivery, to coordinate and support accountability and decision making between organisations and professionals to add overall value to the system.

Linking the micro, meso and macro level: normative integration

Another integration dimension that achieves connectivity and also spans the micro, meso and macro level in a system is known as normative integration [5, 19, 20]. It is a less tangible but essential feature to facilitate inter-sectorial collaboration and ensure consistency between all the levels of an integrated system. Veil and Hubert [58] define normative integration as: 'ensuring coherency between the actors' systems of value, service-organization methods, and the clinical system' [p.76]. Integration is to a large extent shaped by and based on professional behaviour and attitudes [34, 41, 59]. Informal coordination mechanisms based on shared values, culture, and goals across individuals, professionals and organisations are considered as essential. Person-focused and population-based care are important social norms, that should guide behaviour within a health system. In the involvement of various actors different frames of reference need to be combined to improve the health of a population. The clashing of cultures (e.g. between medical and non-medical professionals) is one of the reasons why many integration efforts fail [6, 45]. A clear mission and vision that reflects the needs of the local population is considered a critical success factor for population-based care [32, 60]. Mutual shared goals and an integrative culture are necessary at all levels of an integrated system, and can be created by leadership [6]. Particularly at the professional and management level, leadership plays an important role in propagating an integrated approach [6, 20, 58]. Normative integration can provide a common frame of reference that binds together all the levels of an integrated system. Normative integration is defined as follows: The development and maintenance of a common frame of reference (i.e. shared mission, vision, values and culture) between organisations, professional groups and individuals.

Combining primary care and integrated care

Figure 3 shows our conceptual framework that combines the primary care and integrated care literature into a holistic picture. The core value of primary care is the integration of the biomedical, psychological and social dimensions of health and wellbeing, expressed in our conceptual framework as person-focused and population-based care. The person-focused and population-

based care perspectives provide a foundation upon which the entire conceptual framework rests. They serve as guiding principles for achieving better coordination of services across the entire care continuum. The integrative functions of primary care (first contact, continuous, comprehensive, and coordinated care) are incorporated implicit in the dimensions of integrated care. We make a distinction between the levels of care when focussing on integration. At the macro level system integration puts the individual needs at the heart of the system in order to meet the needs of the population. That is because system integration incorporates the notion that what is best for individuals within a population is best for the population. This holistic view requires simultaneous horizontal and vertical integration to improve the overall health and wellbeing of individuals and the population. Our framework is therefore visualised as a concentric circle, with the person-focused perspective at the centre. Integration at the meso level emphasises a population-based approach, requiring professional and organisational integration to facilitate the continuous, comprehensive, and coordinated delivery of services to a defined population. At the micro level clinical integration highlights the person-focused perspective, ensuring that service users experience continuous care. Health professionals have to take proper account of the needs of individuals, so that the services provided are matched (both horizontally and vertically) to their needs. This may mean that integration may be pursued at the meso and macro level, when services from other providers or organisations are needed. Finally, functional and normative integration spans the micro, meso and macro level and ensures connectivity within a system.

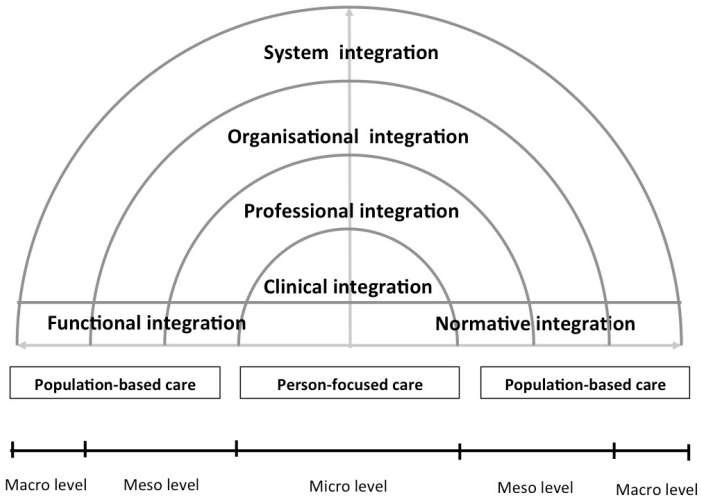

Figure 3: Conceptual framework for integrated care based on the integrative functions of primary care

DISCUSSION

This paper contributes to the conceptualisation of integrated care from a primary care perspective. We constructed a framework to understand the complex phenomenon of integrated care. This means a simplification of reality which helps to better understand the complex interactions of integrated care [16]. We suggest that integration has to be pursued at different levels within a system to facilitate the continuous, comprehensive, and coordinated delivery of services to individuals and populations. How these integration levels interact will vary according to the specific context in which they develop. There are several directions for further research grounded in our new framework. First, the model provides further guidance to study the preferred directions of integration: Is it for instance a 'bottom-up' (clinical), 'top-down' (system) or two-sided (bottom-up and top-down) approach as specified by Kodner en Spreeuwenberg [13]. Second, the framework provides directions to identify the optimal scenario for integration and the contribution of the different integration mechanisms. For instance, our model in combination with the work of Leutz [17] and Ahgren and colleagues [41] can be used to discover the extent of integration at all integration levels in conjunction. However, there are some methodological challenges that arise from our conceptualisation. First, evidence-based knowledge about integration is hampered by the lack of standardised, validated tools and indicators to measure integration [61, 62]. For instance, most available evidence is based on small pilots, what makes it difficult to generalise these findings [63]. Second, there is often a lack of information regarding the validity and reliability of measurement tools [61, 62]. The inter-sectorial nature of integrated care and primary care requires a comprehensive mixed method approach that can be applied across multiple settings [64, 65]. However, most literature on the measurement of integrated care contains a wide variety of concepts, methods and measurements [61]. More research is needed to build up evidence with validated measurement tools to evaluate integrated care initiatives in a more synergetic and analytic way. The conceptual framework presented in its current form is intended for further testing, refinement and development. As the conceptual framework is built on the theoretical concept of primary care, we invite further discussion on whether and how far the framework may apply in other integrated care settings (for example in specialty care or intramural settings). Ultimately, we hope to develop our framework as a tool for conducting analysis of integrated care initiatives to be used to test for causal relationships among the different integration levels. Thereafter, the framework will be validated in the Primary Focus Program. We hope that our framework provides a comprehensive base for policymakers, managers, professionals and other stakeholders to better understand the synergetic nature of integrated care.

CONCLUSION

We conclude that to deliver integrated, person-focused, and population-based care, vertical- and horizontal integration through inter-sectorial partnerships across the health and social service

system is needed. Our conceptualization includes multiple dimensions of integration that play complementary roles on the micro (clinical integration), meso (professional- and organisational integration) and macro (system integration) level to deliver comprehensive services that address the needs of people and populations. Functional and normative integration can ensure connectivity of all the levels of a system.

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CHAPTER 3

TOWARDS A TAXONOMY FOR INTEGRATED CARE: A MIXED-METHODS STUDY

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ABSTRACT

Introduction

Building integrated services in a primary care setting is considered an essential important strategy for establishing a high-quality and affordable health care system. The theoretical foundations of such integrated service models are described by the Rainbow Model of Integrated Care (RMIC), which distinguishes six integration dimensions (clinical, professional, organisational, system, functional and normative integration). The aim of the present study is to refine the RMIC by developing a taxonomy that specifies the underlying key features of the six dimensions.

Methods

First, a literature review was conducted to identify features for achieving integrated service delivery. Second, a thematic analysis method was used to develop a taxonomy of key features organised into the dimensions of the RMIC. Finally, the appropriateness of the key features was tested in a Delphi study among Dutch experts.

Results

The taxonomy consists of 59 key features distributed across the six integration dimensions of the RMIC. Key features associated with the clinical, professional, organisational and normative dimensions were considered appropriate by the experts. Key features linked to the functional and system dimensions were considered less appropriate.

Discussion

This study contributes to the ongoing debate of defining the concepts and typology of integrated care. This taxonomy provides a development agenda for establishing an accepted scientific framework of integrated care from an end-user, professional, managerial and policy perspective.

INTRODUCTION

Integrated care is increasingly being promoted as a means for improving accessibility, affordability and the quality of health care, especially for people with complex needs [1, 2]. Essential for achieving desired health outcomes and limiting costs, primary care is considered the cornerstone of such integrated care approaches [3-5]. However, despite the increasing popularity of developing integrated service models in a primary care setting a solid knowledge base is lacking [6]. In particular, the knowledge base is hampered by the lack of common terminology and typology regarding integrated care [2].

In a recent article, we proposed the Rainbow Model of Integrated Care (RMIC) [7] as a framework to unravel the complexity of integrated care. The RMIC distinguishes four dimensions that play inter-connected roles on the macro- (system integration), meso- (organisational, professional) and micro-level (clinical integration) and two more dimensions (functional and normative integration) that enable the connectivity between the various integration levels (see Table 1). The RMIC is considered useful for understanding the complex and multi-dimensional nature of integrated care [8]. However, the underlying key features of these six integrated care dimensions are yet unknown. Insight into the underlying key features is essential for achieving a common operational understanding of integrated care and for contributing to program implementation, policy formulation and research analysis.

Consequently, there is a need for a common taxonomy that can classify the broad spectrum of integrated care approaches. A taxonomy is a formal system to classify a multifaceted complex phenomena [9], and, in this study, this complex phenomena is "integrated care." A taxonomy applied to integrated care would facilitate the description and comparison of different integrated care programs which is essential for translating research findings and evidence into practical tools for policy and practical implementation. Likewise, this taxonomy is needed to support effective deployment of integrated service models in a primary care setting. The aim of the present study is to contribute to a better understanding and operational consensus regarding the concept of integrated care by addressing the following objectives:

1. Based on a literature review, define the RMIC by developing a taxonomy that specifies the underlying key features of the six integrated care dimensions;
2. Investigate the appropriateness of the key features to achieve integrated care in a primary care setting among a group of experts from The Netherlands.

Table 1: Integrated care dimensions of the RMIC

Level	Dimension	Description
Micro	**Clinical integration**	The coordination of person-focused care in a single process across time, place and discipline.
Meso	**Professional integration**	Inter-professional partnerships based on shared competences, roles, responsibilities and accountability to deliver a comprehensive continuum of care to a defined population.
Meso	**Organisational integration**	Inter-organisational relationships (e.g. contracting, strategic alliances, knowledge networks, mergers), including common governance mechanisms, to deliver comprehensive services to a defined population.
Macro	**System integration**	A horizontal and vertical integrated system, based on a coherent set of (informal and formal) rules and policies between care providers and external stakeholders for the benefit of people and populations.
Micro, Meso, Macro	**Functional integration**	Key support functions and activities (i.e. financial, management and information systems) structured around the primary process of service delivery to coordinate and support accountability and decision making between organisations and professionals in order to add overall value to the system.
Micro, Meso, Macro	**Normative integration**	The development and maintenance of a common frame of reference (i.e. shared mission, vision, values and culture) between organisations, professional groups and individuals.

Adopted from Valentijn et al. (2013) [7]

THEORY AND METHODS

Theoretical background

Integrated care, as defined by Leutz (1999), is a broad inter-sectorial system approach that aims to align the health care system (acute, primary medical and skilled) with other human service systems (e.g. long-term care, education, and vocational and housing services) [10]. Primary care, as stated in the Alma-Ata declaration of 1978 [11], describes a similar inter-sectorial system approach with a distinct community and socio-political focus. However, theoretical discourses on integrated care and primary care as a broad inter-sectorial system approach have failed to produce practical relevance for practices and policies [12]. To bridge this gap, a common taxonomy is needed to move towards a clearer operational consensus regarding integrated care as a whole.

In this article, integrated care refers to ambulatory care settings in which a network of multiple professionals and organisations across the health and social care system provide accessible, comprehensive and coordinated services to a population in a community. Based on the RMIC, integration of services can be achieved at a system (system integration), institutional (organisational integration), professional (professional integration) and service (clinical integration) levels. The distinctions between these different levels provide comprehensive insight into the features needed to achieve integrated care within a system. Throughout this

paper, we refer to features of integrated care as entities, processes, or structures which operate in particular contexts to achieve integrated care.

METHODS

We applied a mixed-method approach consisting of: 1) a literature review, 2) a thematic analysis to develop a taxonomy, and 3) a Delphi study to test the relevance of the taxonomy among a group of experts from The Netherlands. Because no patients were involved in this study, ethical approval was not required under Dutch law.

Literature review

A literature review was conducted to identify the key features that could be used to organise integrated care. The databases Cochrane Library, Medline, Scopus, and Business Source Premier were searched for articles published during the period from January 2002 to December 2012 and written in English. Because the present study specifically focused on the organisation of integrated care, the focus of the literature review was narrowed to system (inter-sectorial), organisational (inter-organisational) and professional (inter-professional) models of integration. The following search terms were used: "delivery of health care," "integrated service system," "integrated systems," "inter-organizational collaboration," "inter-organizational cooperation," "inter-professional collaboration" or "inter-professional work" and "quality model." The detailed search and selection strategy appears in "Additional file 1."

To be included, publications had to meet the following criteria: 1) a description of a theory or model of inter-sectorial, inter-organisational or inter-professional service delivery, 2) a description of the features (underlying entities, processes, or structures) used to achieve integrated service delivery. Publications were excluded that reported clinical interventions and a main focus on clinical outcome measures (e.g. HbA1c levels or hospital re-admission rates) or process indicators (e.g. percentage of patients receiving treatment).

Two researchers (PV and IB) independently reviewed the titles and abstracts. Only when both of the researchers independently found the title and abstracts relevant, the article was retrieved. Any disagreements between the researchers were resolved by consensus. For every included publication, we briefly described the theory or model, the study design, and the main research theme of the article.

Thematic analysis

A three-step thematic analysis method was used [13, 14] to synthesise the results of the literature review and to develop a taxonomy of key features. First, two researchers (PV and IB) generated an initial list of features from the included articles. To be initially included, features had to meet the following three criteria: 1) Relevance (related to achieving clinical, professional, organisational, system, functional and/or normative integration); 2) Theoretical foundation (presence of a theory, model or logic was described in the article); and 3) Clarity (clear definition

or descriptions of the reported features). Thereafter, the initial list of features was categorised across the six dimensions of the RMIC according to the description of each feature as reported in the literature. Any disagreements between the researchers were resolved by consensus. Second, three researchers (PV, IB and MB) independently assessed the compiled taxonomy and combined features into overarching key features within each integrated care dimension. During three discussion rounds, overarching key features were compared for agreement among the researchers and iterative revisions were made. Also, features that were identical or nearly identical were merged and descriptions were formed during these rounds. Finally, two external researchers (DK and JM) and a research assistant independently reviewed the preliminary taxonomy and offered feedback for refining the descriptions of the key features. Feedback included suggestions for merging and/or reorganising specific key features within and between the different dimensions. PV and IB summarised the feedback and revised the taxonomy accordingly.

Delphi study

A Delphi study was conducted using the RAND UCLA appropriateness method [15]. In the first round, a self-administered questionnaire was used, and in the second round the experts revalued their first round score after a group discussion in a physical meeting. The aim of the second discussion round was to determine if ratings were different due to real disagreement or due to a misunderstanding or misinterpretation of the features [15]. A purposive sampling strategy was used to identify experts with experience in practice or science regarding the deployment of integrated service models in a primary care setting. The following selection criteria were used for the experts: a scientific (doing research) or practical (working in a professional or service organisation) background regarding the organisation of integrated primary care delivery. Based on this criteria, experts were selected to ensure that a balanced number of both were represented. Thirty-three experts were approached by e-mail and/or telephone and invited to participate. We then included experts that indicated that they would be available to participate in both consensus rounds. Following the RAND UCLA appropriateness method, between nine and fifteen experts were ultimately selected [15].

During round one, the experts received written information on the research aims and details of the Delphi procedure. After they committed to participate, they received a link to an online questionnaire and were asked to rate the appropriateness of each feature for achieving integrated care in a primary care setting on a nine-point Likert-scale, ranging from 1 (completely irrelevant) to 9 (extremely relevant). The features were randomly presented to the experts to avoid order and information bias, which could potentially transpire especially if the features were presented in the order of the six RMIC dimensions. In addition, all experts were invited to suggest possible rephrasing of the descriptions of the features and add new features. After one week, reminders were sent by e-mail to non-responders.

In round two, a face-to-face meeting of the expert panel took place which was chaired by one of the researchers (MB) with experience in facilitating group discussions. The meeting's

goal was to discuss the results of round one and revalidate the features. Based on the results of round one, a summary report was provided to the experts with the following key feedback information: 1) respondents' own ratings in round one, 2) median agreement rating, 3) summary of qualitative comments, as well as 4) whether consensus was achieved at round one. Because of time, we decided to only discuss the features that did not reach agreement in the first round. We clustered these features by theme (e.g. leadership, strategy, value creation, external environment) and asked the highest and lowest scoring panel member to clarify his or her consideration. Next, a short discussion among all group members took place. Finally, the experts were asked to, once again, individually rate the features that were not agreed upon in the first round.

Data Analysis

The data extracted during the thematic analysis process were listed and analysed using MS Excel. The criteria of the RAND UCLA appropriateness method were used to analyse the data from the Delphi study [15]. We categorized the overall panel median as follows: 1-3 as inappropriate, 4-6 as equivocal and 7–9 as appropriate. Agreement signified that ≥ 70% of panellists' ratings were within the same 3-point region (that is, 1–3, 4–6, or 7–9) as the observed median. A feature was defined as "appropriate" with an overall panel median score of ≥ 7 and a level of agreement of ≥ 70% within the 3-point region 7–9. A panel median of 4-6 or median with a consensus of ≤ 70% within the same 3-point region was defined as "equivocal." A feature with a panel median of 1-3 and a level of agreement of ≥ 70% within the 3-point region 1-3, was defined as "inappropriate." The decision rules used in both rounds are shown in Table 2. Values were computed using SPSS version 21 for Windows (IBM Statistics).

Table 2: Decision rules of the Delphi study

		Median (1-3)	Median (4-6)	Median (7-9)
Round 1	Agreement (≤ 70 %)	Equivocal; discussion round 2	Equivocal; discussion round 2	Equivocal: discussion round 2
	Agreement (≥ 70%)	Inappropriate; excluded after round 1	Equivocal; discussion round 2	Appropriate; included after round 1
Round 2	Agreement (≤ 70 %)	Equivocal	Equivocal	Equivocal
	Agreement (≥ 70%)	Inappropriate	Equivocal	Appropriate

RESULTS

Literature review

Our literature search yielded 534 potentially relevant publications (Figure 2). After screening titles and abstracts, we retrieved 214 potentially relevant publications for their full-text. We excluded 320 publications because they were not considered relevant to the current study. Out

of the 214 eligible publications, 13 duplicates were removed and another 122 publications were excluded for reasons given in Figure 2. Finally, a total of 79 publications were included in the literature review.

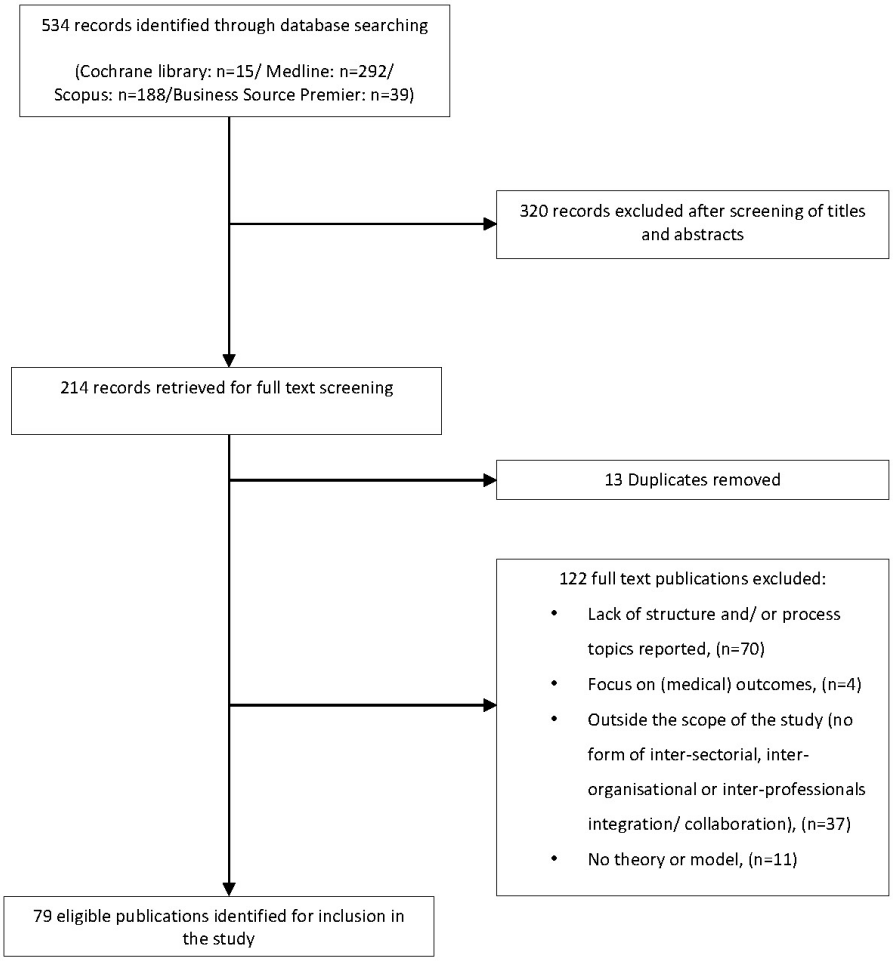


Figure 2: Flowchart of the literature search

Most of the included publications were based on empirical studies (66%, n = 52); other publications were based on non-empirical study designs (27%, n = 27). Table 3 lists the main research topics of the included publications. Approximately one-third of the publications focused on inter-organisational collaboration (30%, n = 24); other common themes were integrated service delivery (18%, n = 14), inter-professional collaboration (11%, n = 9) and inter-organisational learning (10%, n = 8). More descriptive information can be found in "Additional file 2."

Table 3: Research themes of the included publications

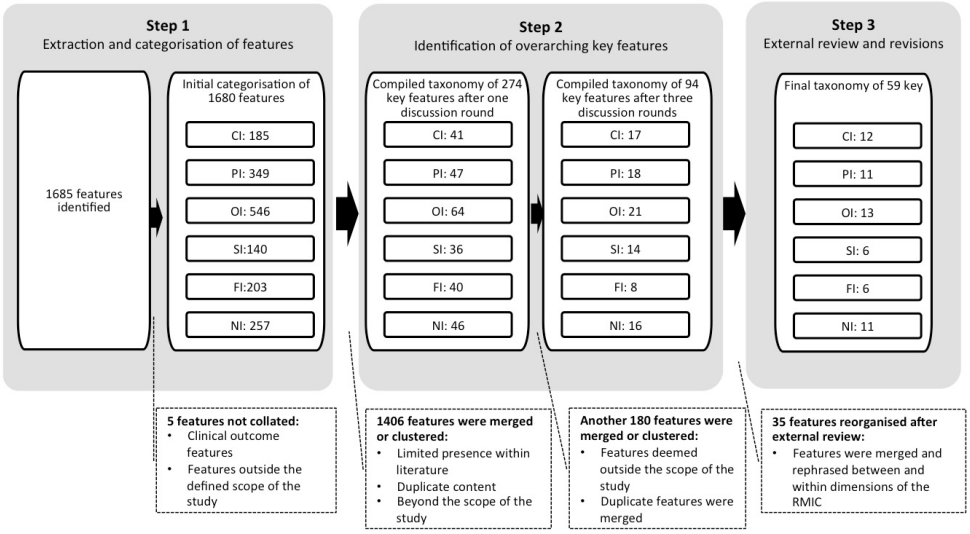
Main research topic	Studied by
Accountable care organizations	[16-18]
Integrated care networks	[19-23]
Integrated service delivery	[24-37]
Inter-organisational collaboration	[38-61]
Inter-organisational learning	[62-69]
Inter-professional collaboration	[70-78]
Inter-professional learning	[79-82]
Quality improvement collaborative	[83-85]
Combined themes	[86] [a] [87, 88] [b]
Other	[89-94]

[A] Combination of the research themes inter-professional and inter-organisational collaboration.

[B] Combination of the research themes inter-organisational and inter-professional learning.

Thematic analysis

Figure 3 provides a schematic overview of the thematic analyse process employed to synthesise the literature and to develop the taxonomy of key features. The reasons for removing features at each step of the thematic analysis process appear in the dashed boxes in Figure 3. First, an initial list of 1,685 features was extracted from the 79 included publications of which 1,680 features were categorised across the six dimensions of the RMIC (see Step 1 in Figure 3). Second, the compiled taxonomy of 1,680 features was reviewed by three authors (PV, MB and IB) to identify the broader and overarching key features per dimension. During the first discussion round, 274 key features were identified by the three reviewers. There was little disagreement among the three authors on combining features to form over-reaching key features, and any existing disagreement was easily resolved by discussion. During these subsequent discussion phases, most features were merged within each dimension due to similar or nearly identical content. After the third discussion round, ninety-four potential key features were identified (see Step 2 in Figure 3). Finally, the compiled taxonomy was reviewed by two external reviewers (DK and JM) and a research assistant. Based on the feedback of the reviewers, the features were further merged and refined within and between the six dimensions based on their similar content (see Step 3 in Figure 3). The resulting taxonomy of fifty-nine key features is shown in Table 4.



Abbreviations: CI, clinical integration; PI, professional integration; OI, organisational integration; SI, system integration; FI, functional integration; and NI, normative integration

Figure 3: Flowchart of the thematic analysis process

Table 4: Taxonomy of 59 key features

Key features per dimension	Description#
Clinical integration	
1. Centrality of client needs	The principle of care is to address the needs of clients in terms of medical, psychological and social aspects of health.
2. Case management	Coordination of care for clients' with a high risk profile (e.g. identifying risks, developing policies and guidance).
3. Patient education	Education for clients is focused on medical, psychological and social aspects of health.
4. Client satisfaction	User satisfaction of the individual client is central to the organisation of care.
5. Continuity	The organisation of care aims to provide fluid care delivery for an individual client.
6. Interaction between professional and client	Attitude and behavioural characteristics between professional and client regarding all health needs of the client.
7. Individual multidisciplinary care plan	Implementation of a multidisciplinary care plan at the individual client level.
8. Information provision to clients	Provide unambiguous and understandable information at the individual client level.
9. Service characteristics	Provision of services is focused on medical, psychological and social aspects of health.
10. Client participation	Clients are (pro)actively involved in the design, organisation and provision of care at the operational level.
11. Population needs	The interdisciplinary approach is consistent with the dominant needs of the population.
12. Self-management	Tailor-made support of self-management at the individual client level.
Professional integration	
13. Inter-professional education	Inter-professional education for professionals focused on interdisciplinary collaboration.
14. Shared vision between professionals	A shared vision between professionals focused on the content of care.
15. Agreements on interdisciplinary collaboration	Agreements on the establishment of interdisciplinary cooperation at the operational level.
16. Multidisciplinary guidelines and protocols	Multidisciplinary guidelines and protocols are implemented in coherence with the operational level.
17. Inter-professional governance	Inter-professional governance is focused on openness, integrity and accountability between professionals at the operational level (e.g. joint accountability, appeal on pursued policies and responsibilities).
18. Interpersonal characteristics	Interpersonal characteristics of the professionals involved in the partnership (e.g. trust, equality, respect, values).
19. Clinical leadership	Accepted leadership with power and influence at the operational level (e.g. professional status characteristics such as reputation, specialization, position and seniority).
20. Environmental awareness	Environmental awareness of professionals with regard to economic, social and political developments.
21. Value creation for the professional	Value is added for the individual professional through interdisciplinary collaboration.
22. Performance management	Performance management at the operational level is focused on improving health outcomes for the individual client and the population.
23. Creating interdependence between professionals	Creating mutual interdependencies between professionals regarding interdisciplinary collaboration.
Organisational integration	
24. Value creation for organisation	Value is added through the collaboration of each involved organisation.
25. Inter-organisational governance	Inter-organisational governance is focused on openness, integrity and accountability between organisations at the strategic level (e.g. joint responsibilities, strategy and policy).

26. Informal managerial network	Informal network of managers within the collaboration.
27. Interest management	A climate that attempts to bridge the various interests (e.g. social, organisational and personal) at the operational, tactical and strategic level.
28. Performance management	Collective elaborated performance management between organisations within the collaboration.
29. Population needs as binding agent	The needs of the population are central in the collective policy of the various organisations in the collaboration.
30. Organisational features	Organisational features of inter-organisational collaboration (e.g. legal structure, number of organisations, profit vs. non-profit).
31. Inter-organisational strategy	A collective elaborated strategy exists between the organisations within the collaboration.
32. Managerial leadership	Leadership with power and influence at a strategic level (e.g. reputation, seniority and formal position).
33. Learning organisations	Collective learning power between the organisations within the collaboration (e.g. joint research and development programs).
34. Location policy	A collective location policy between the organisations within the collaboration (e.g. coordinated housing and facilities).
35. Competency management	Collectively utilize and select competencies of professionals and staff to the greatest possible extent for the objectives of the collaboration.
36. Creating interdependence between organisations	The organisation of the collaboration aims to create mutual interdependencies between organisations (e.g. multi-year rental agreement).
System integration	
37. Social value creation	Value is added through the collaboration of social objectives and interests.
38. Available resources	Available resources in the environment of the collaboration (e.g. usable buildings, (over)capacity, professionals and funding streams).
39. Population features	Health determinants of the population in the environment of the partnership (e.g. population composition and use of care).
40. Stakeholder management	Engagement of various stakeholders (e.g. municipality, patient organisations and health insurance companies).
41. Good governance	Creating trust towards external stakeholders (e.g. municipality and health insurance companies) based on working method, reputation, management, control and/or supervision.
42. Environmental climate	Political, economic and social climate within the environment of the collaboration (e.g. market characteristics, regulatory framework, competition).
Functional integration	
43. Human resource management	Aligned Human Resource Management within the collaboration (e.g. joint staffing and personnel).
44. Information management	Aligned information management systems accessible at an operational, tactical and strategic level (e.g. monitoring and benchmarking systems).
45. Resource management	Coherent use of resources (e.g. collective real estate and funding).
46. Support systems and services	Aligned support systems and services at the operational level (e.g. facility management and secretarial support).
47. Service management	Aligned service management for the client (e.g. collective telephone numbers, counter assistance and 24-hour access)
48. Regular feedback of performance indicators	Regular feedback of performance indicators for professionals at the operational level to enable them to improve their performance.

Normative integration

49. Collective attitude	Collective attitude within the collaboration towards open communication, sincerity and respect at operational, tactical and strategic levels.
50. Sense of urgency	Awareness regarding the need and purpose to collaborate at the operational, tactical and strategic levels.
51. Reliable behaviour	The extent to which the agreements and promises within the collaboration are fulfilled at operational, tactical and strategic levels.
52. Conflict management	The ability to effectively manage interpersonal conflicts within the collaboration.
53. Visionary leadership	Leadership based on a personal vision that inspires and mobilizes people.
54. Shared vision	A collectively shared long-term vision within the collaboration at the operational, tactical and strategic levels.
55. Quality features of the informal collaboration	Effectiveness and efficiency of the informal collaboration at the operational, tactical and strategic levels (e.g. group dynamics and attention to the undercurrent).
56. Linking cultures	Linking cultures (e.g. values and norms) with different ideological values within the collaboration at the operational, tactical and strategic levels.
57. Reputation	Individual reputation of those people involved in the collaboration.
58. Transcending domain perceptions	The ability to transcend one's own professional domain within the collaboration at the operational, tactical and strategic levels.
59. Trust	The extent to which those involved in the collaboration at operational, tactical and strategic levels trust each other.

[#] Descriptions are derived from the literature, and were refined during Step 3 of the thematic analysis process.

Delphi study

In total, fourteen persons participated in the first round of the expert panel (response rate 40%). The main reason experts choose not to participate was their inability to be available for the second face-to-face meeting. The panel was a balanced group of experts with a scientific (50%, n=7) or practical (50%, n=7) background. The panellists had a mean age of 45.4 years (SD: 11.3, range: 28-68), and a mean of 11.6 years (SD: 8.8, range 4-40) of experience in integrated care initiatives. Based on round one, 25 of the 59 key features were considered appropriate (overall panel median of 7-9 and consensus of ≥ 70% within the same 3-point region, see Table 5). Thirty-four features were rated as equivocal for achieving integrated care in a primary care setting (overall panel median of 4-6 or median with consensus of ≤ 70% within the same 3-point region). None of the key features were considered inappropriate (overall panel median of 1-3 and consensus of ≥ 70% within the same 3-point region), and the experts did not propose any new features.

In the second round, one expert with practical experience and three scientific experts could not attend, resulting in a ten-member panel. This had no major impact on the composition of the panel compared to round one. The panellists in round two had a mean age of 47.5 years (SD: 11.5, range: 28-68), and a mean of 10.9 years (SD: 8.8, range 4-40) of experience. Discussion during the second round on the thirty-four equivocal features resulted in an extra nine features rated as appropriate. Within the clinical dimension, the key features interaction between professional and client (no. 6) and population needs (no. 11), and within the organisational dimension the key features interest management (no. 27) and managerial leadership (no. 32) were rated appropriate after the second round. Within functional dimension the key feature regular feedback of performance indicators (no. 48) reached consensus after the second round. Furthermore, within the normative dimension the key features sense of urgency (no.50), visionary leadership (no. 53), quality features of the informal collaboration (no. 55) and linking cultures (no. 56) were rated appropriate. Twenty-four key features remained equivocal after the second round, and only one key feature was rated as inappropriate, namely reputation (no. 57) within the normative dimension.

Table 5: Results of the Delphi study

	Delphi study				
	Round 1 (n= 14)		**Round 2** (n= 10)		
Taxonomy for integrated care	Panel median (30th and 70th percentile)	Agreement (%)	Panel median (30th and 70th percentile)	Agreement (%)	Final consensus
Clinical integration					
1. Centrality of client needs	8.5 (6.5-9)	71.4	N/A	N/A	Appropriate
2. Case management	8 (7.5-8)	85.7	N/A	N/A	Appropriate
3. Patient education	5 (4.5-7)	42.9	4 (3.3-5.7)	60	Equivocal
4. Client satisfaction	6.5 (5-8)	35.7	5 (5-7)	50	Equivocal
5. Continuity	8 (7.5-9)	78.6	N/A	N/A	Appropriate
6. Interaction between professional and client	7 (5-8.5)	50	8 (6.3-8.7)	70	Appropriate
7. Individual multidisciplinary care plan	7.5 (7-8)	78.6	N/A	N/A	Appropriate
8. Information provision to clients	5 (4.5-7)	57.1	7 (6-7.7)	60	Equivocal
9. Service characteristics	8 (7.5-9)	78.6	N/A	N/A	Appropriate
10. Client participation	6 (5-8)	42.9	5.5 (4.3-6)	60	Equivocal
11. Population needs	7 (5.5-8.5)	57.1	7 (7-8)	80	Appropriate
12. Self-management	5 (3.5-7)	35.7	4.5 (4-5.7)	70	Equivocal
Professional integration					
13. Inter-professional education	8 (7.5-8)	92.9	N/A	N/A	Appropriate
14. Shared vision between professionals	8 (8-9)	78.6	N/A	N/A	Appropriate
15. Agreements on interdisciplinary collaboration	8 (8-9)	85.7	N/A	N/A	Appropriate
16. Multidisciplinary guidelines and protocols	7.5 (7-8)	85.7	N/A	N/A	Appropriate
17. Inter-professional governance	7.5 (6.5-8)	71.4	N/A	N/A	Appropriate
18. Interpersonal characteristics	6 (4.5-7.5)	35.7	6 (3.6-6.7)	40	Equivocal
19. Clinical leadership	6 (5-7)	42.9	7 (6-7.7)	60	Equivocal
20. Environmental awareness	5 (3-6.5)	42.9	5.5 (4.3-7)	60	Equivocal
21. Value creation for the professional	7.5 (6.5-8)	71.4	N/A	N/A	Appropriate
22. Performance management	6.5(5-8)	35.7	7.5 (5.3-8.7)	60	Equivocal
23. Creating interdependence between professionals	6 (5-6.5)	64.3	5 (5-6)	60	Equivocal
Organisational integration					
24. Value creation for organisation	5 (4.5-6.5)	57.1	4.5 (3.3-5)	60	Equivocal

25. Inter-organisational governance	7 (6.5-8)	71.4	N/A	N/A	Appropriate
26. Informal managerial network	5 (4.5-6.5)	50	4.5 (3.3-5)	70	Equivocal
27. Interest management	7.5 (6-8)	64.3	8 (7-8)	90	Appropriate
28. Performance management	7 (7-8)	78.6	N/A	N/A	Appropriate
29. Population needs as binding agent	7 (6.5-7)	71.4	N/A	N/A	Appropriate
30. Organisational features	6 (5-7)	50	6 (6-7)	60	Equivocal
31. Inter-organisational strategy	8 (7-8)	92.9	N/A	N/A	Appropriate
32. Managerial leadership	6.5 (5-7.5)	35.7	7 (7-7.7)	80	Appropriate
33. Learning organisations	7 (6.5-8)	71.4	N/A	N/A	Appropriate
34. Location policy	6 (6-7)	50	6.5 (6-7)	40	Equivocal
35. Competency management	7 (6.5-8)	71.4	N/A	N/A	Appropriate
36. Creating interdependence between organisations	5.5 (3.5-7.5)	35.7	4 (3-5)	50	Equivocal
System integration					
37. Social value creation	6 (4-8)	21.4	6 (4-8.4)	40	Equivocal
38. Available resources	6 (5.5-7)	42.9	6 (6-7)	60	Equivocal
39. Population features	4 (3-5.5)	28.6	5.5 (5-6.7)	60	Equivocal
40. Stakeholder management	7.5 (6.5-8)	71.4	N/A	N/A	Appropriate
41. Good governance	6.5 (5-8)	35.7	6 (5-6)	70	Equivocal
42. Environmental climate	5 (3-6.5)	35.7	6.5 (5-7)	40	Equivocal
Functional integration					
43. Human resource management	7 (5-7.5)	64.3	6.5 (5.3-7)	40	Equivocal
44. Information management	8 (7-8.5)	92.9	N/A	N/A	Appropriate
45. Resource management	6 (5-7)	50	6 (5-7)	60	Equivocal
46. Support systems and services	6 (5-7)	50	6 (5-6)	80	Equivocal
47. Service management	7.5 (6.5-8)	71.4	N/A	N/A	Appropriate
48. Regular feedback of performance indicators	7 (6-8)	57.1	7 (6.3-8)	70	Appropriate
Normative integration					
49. Collective attitude	8 (7-8)	78.6	N/A	N/A	Appropriate
50. Sense of urgency	6.5 (6-8)	28.6	8 (6.3-8)	70	Appropriate
51. Reliable behaviour	8 (6.5-8)	71.4	N/A	N/A	Appropriate
52. Conflict management	6 (4-7)	42.9	6 (6-7)	60	Equivocal
53. Visionary leadership	7 (5.5-8)	64.3	7 (7-8)	80	Appropriate
54. Shared vision	8 (8-8)	92.9	N/A	N/A	Appropriate

55.	Quality features of the informal collaboration	7 (5-7)	57.1	7 (7-8)	90	Appropriate
56.	Linking cultures	7 (5-8)	57.1	7.5 (6.3-8)	70	Appropriate
57.	Reputation	4 (3-5)	35.7	3.5 (3-4)	50	Inappropriate
58.	Transcending domain perceptions	8 (8-8)	92.9	N/A	N/A	Appropriate
59.	Trust	8 (8-8.5)	100	N/A	N/A	Appropriate

N/A: Not applicable as a consensus had already been reached.

The results in Table 5 show that the appropriate key features are unevenly distributed across the six dimensions of the taxonomy. In particular, within the dimension of system integration, stakeholder management (no. 40) was the only key feature considered appropriate. Additionally, within the dimension of functional integration, half of the key features that refer to key support functions were considered equivocal by the experts; human resource management (no. 43), resource management (no. 45) and support systems and services (no. 46). Particularly noteworthy within the dimension of clinical integration is that five of its key features (nos. 3, 4, 8, 10 and 12) were considered equivocal by the experts for achieving integrated care in a primary care setting.

Corresponding features across the dimensions of the taxonomy, such as value creation and leadership, also showed an uneven pattern. For example, key features concerning value creation (nos. 21, 24 and 37) were only considered appropriate from a "professional" integration perspective (no. 21) and not from an organisational or system integration perspective. Moreover, key features regarding leadership (nos. 19, 32 and 53) were only considered appropriate from an organisational perspective and normative integration perspective, but not from a professional integration perspective (no. 19).

DISCUSSION

This study aimed to define a taxonomy to contribute to the ongoing debate of specifying the concept of integrated care using a theory-driven mixed-method approach. Based on the theoretical foundations of the RMIC [7] and a literature review, we developed a taxonomy of 59 key features distributed across six integration dimensions (clinical, professional, organisational, system, functional and normative integration). A Delphi study further indicated that 34 of these 59 key features were considered appropriate for achieving integrated care in a primary care setting. The majority of the key features associated with the clinical, professionals, organisational and normative dimensions of integration were considered appropriate for achieving integration in a primary care setting. Key features associated with the functional and system dimensions of integration were considered less appropriate.

The results of the Delphi study indicated that the key features associated with the professional and organisational dimensions were considered appropriate for achieving integration in a primary care context. This result is not surprising as the professional and organisational perspective regarding integrated care has been the prime focus of practice, science and policies [2, 95]. Moreover, the experts considered the key features associated with the normative dimension of the taxonomy as appropriate enablers for achieving integrated service models in a primary care setting. While existing integrated care theories, models and instruments tend to have a limited focus on these "soft enabling features" of integrated care [96-99], it is, nevertheless, very likely that these normative or soft features play a crucial role in the development of various complex inter-sectorial, inter-organisational and inter-professional service models of integration. Although the existing academic literature also suggests that functional integration (e.g. information

management systems) are important enabling mechanisms for achieving integrated care [100], fewer of these key features were considered appropriate when compared to the normative key features.

An intriguing finding was that, despite socio-political influences being frequently mentioned as essential preconditions for achieving integrated care [2, 5, 101, 102], the experts considered most of the key features associated with the system integration perspective as equivocal for achieving integration in a primary care setting. A possible explanation for this inconsistency might be found in the composition of our expert panel, as we did not explicitly include experts with a macro-policy background (e.g. policymakers or health insurers). This might have resulted in the underexposure of the macro-system perspective in the results of our Delphi study. On the other hand, at the micro-clinical level, the experts considered the key features related to the involvement of clients and patients as equivocal for achieving integration in a primary care setting. Most of the experts considered integrated service delivery as a "backstage" process for the benefit of clients and patients. This opinion does not concur with the current academic literature that highlights the key position of patients in the integration process [2, 103-106]. This inconsistency might be explained by the fact that patients and clients were not included in the expert panel. The lack of interest being placed at the macro- (system) and micro- (patient) levels made us aware that integrated care can be defined from multiple perspectives depending on the actors involved (e.g. patients, professionals, managers and policymakers) [2]. This indicates the need to develop assessment tools which take into account these various perspectives (e.g. a 360-degree feedback method) when evaluating the performance of an integrate care approach.

Strengths and weaknesses

The strength of this study is its theory-driven mixed-method approach. The taxonomy is theoretically grounded on the RMIC [7] and has a solid base in the current academic literature. The strength of the thematic analysis procedure lies in its potential to synthesise and identify common features across a heterogeneous mix of publications [13, 14, 107]. The Delphi study added substantially towards consensus-based terminology regarding the development of integrated service models within a primary care context.

A limitation of the study relates to the composition of our expert panel, as patients and experts with a macro-policy background were not included. As noted earlier, the lack of emphasis on key features associated with the macro- (system) perspective and patient involvement in achieving integrated care might be due to the composition of our expert panel. We are aware of the fact that this form of selection bias might be present in our Delphi study. However, it appears difficult to include all perspectives in one expert panel without introducing other serious forms of bias (e.g. conflict of interest) [15, 108]. We did not explicitly included experts with a macro-policy background because their presence could influence the (strategic) behaviour of the practice experts, as they are (financially) dependent on these experts for the continuity of their practices. Besides, the results of the Delphi study also confirms that an expert opinion regarding integrated care has a more limited scope compared to a broad theoretical discourse of

integrated care [2, 109-111]. Another limitation of this study relates to the subjective interpretation process during the thematic analyses method. Although the synthesis process was systematic and independently verifiable, subjective judgements of the researchers could have had an impact on the construction of the key features of the taxonomy [14, 112].

Another challenge in the present study relates to the complex nature of integrated care, which can never be fully rationalised or standardised [113-115]. However, the vast majority of research on integrated care is based on an industrial-quality improvement logic which holds that quality standardisation leads to better outcomes and allows for more systematic evaluations [115]. Researchers (ourselves included) often struggle with the delicate balance of collating, analysing and synthesising findings which are academically defensible against research methods that do not necessarily appreciate the underlying epistemological assumptions of integrated care. We have attempted to use a more pragmatic approach to address this gap. By developing a taxonomy that holds much promise, our study aimed to potentially guide the modelling and development of pioneering research approaches across traditional disciplinary boundaries in order reveal the complex inter-relationships at a system, institutional, professional and service level [115]. We think further debate about the underlying epistemological assumptions, methodology and quality considerations of integrated care would be extremely useful. We invite other scholars to explore with us the philosophical basis of integrated care and to establish an agreed upon "state of the science."

Implications for practice and research

Our study fills an important gap in the knowledge base of the concept of integrated care. The key features of the taxonomy provide a crucial differentiation to describe and analyse various types of integrated service models (ranging from comprehensive towards more selective). In this way, the taxonomy might be a valuable contribution for health care professionals, managers, patient organisations, health care service purchasers, and policymakers involved in the complex organisation of integrated service delivery. The taxonomy can also serve as set of hypotheses for future empirical investigation. Moreover, our study is a vital step towards the creation of a common language and an understanding of the concept of integrated care. Future research should explore the relevance and acceptability of our taxonomy in order to establish a common terminology regarding integrated care. In addition, researchers could examine the categorisation of the key features among the dimensions of integrated care in order to further refine the current taxonomy.

CONCLUSION

This study established a taxonomy for integrated care based on the theoretical foundations of the RMIC. The taxonomy can be considered a first step towards a common typology and operational consensus regarding integrated care. More work is needed to develop research methodologies that take into account the various integration processes from an end-user,

professional, managerial and policy perspective in a synergetic way. For this purpose, the taxonomy has established a further developmental agenda for both research and practice.

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ADDITIONAL FILE 1: SEARCH PARAMETERS

Database	Search terms	Limits	Yields	Included after screening of titles and abstracts	Duplicates removed	Included after screening of full-text	Publications
Health databases							
Cochrane Library	("Delivery of Health Care, Integrated"[Mesh]) AND quality model	2002 – 2012 (10 years) English	3	0	0	0	
	Integrated service systems and quality model	2002 – 2012 (10 years) English	12	0	0	0	
Medline	Inter-organizational collaboration AND models	2002 – 2012 (10 years) English	18	14	0	8	[54], [86], [71], [87], [44], [61], [40], [76]
	("Delivery of Health Care, Integrated"[Mesh]) AND quality model	2002 – 2012 (10 years) English	194	79	0	27	[70], [37], [27] [25], [24], [32], [89] [93], [83], [51], [34], [59], [31], [30], [35], [49], [78] [90], [36], [23], [29], [18], [26], [16], [17], [88], [20]
	("Delivery of Health Care, Integrated"[Mesh]) AND "Total Quality Management"[Mesh]	2002 – 2012 (10 years) English	80	18	3	5	[81], [68], [94], [85], [92]
Business databases							
Scopus	Inter-organizational collaboration AND model	2002 – 2012 (10 years) English Medicine Business, Management and Accounting Social Sciences Environmental Science Health Professions Psychology Article Review	77	48	1	17	[57], [52], [42], [58], [46], [67], [55], [64], [45], [53], [39], [66], [60], [63], [50], [65], [48]

	Inter-organizational cooperation AND model	2002 – 2012 (10 years) English Business, Management and Accounting Social Sciences Medicine Nursing Environmental Science Health Professions Article Review	45	18	2	9	[43], [47], [62], [38], [41], [22], [69], [21], [56]
	Inter-professional collaboration AND model	2002 – 2012 (10 years) English Medicine Nursing Social Sciences Health Professions Psychology Article Review	28	17	0	7	[75], [72], [84], [19], [80], [74], [77]
	Inter-professional work AND model	2002 – 2012 (10 years) English Medicine Nursing Social Sciences Business, Management and Accounting Health Professions Psychology Article Review	38	14	3	6	[79], [91], [73], [82], [33], [28]

Business Source Elite (EBSCO host)	Integrated systems AND quality model	2002 – 2012 (10 years) English Academic journals	34	6	0	0
	Integrated delivery systems AND quality model	2002 – 2012 (10 years) English Academic journals	5	0	4	0
Total			**534**	**214**	**13**	**79**

ADDITIONAL FILE 2: CHARACTERISTICS OF INCLUDED STUDIES

Author(s)	Year	Context	Sample size	Study design	Study focus
Amiel and Pincus [24]	2011	Integrated service delivery.	N/A	Descriptive study	A conceptual framework for the delivery psychiatric services.
Antoncica and Prodan [38]	2008	Inter-organisational collaboration.	226 executives.	Cross-sectional study	The relationship between corporate entrepreneurship and organisational performance within inter-organisational relationships.
Axelsson and Bihari Axelsson [39]	2006	Inter-organisational collaboration.	N/A	Expert opinion	The development of a conceptual framework for inter-organisational integration in public health.
Bai, Wells and Hillemeier [40]	2009	Inter-organisational collaboration.	75 child welfare agencies.	Prospective cohort study	Relationship between inter-organisational relationships and use of mental health services.
Bainbridge et al. [19]	2010	Integrated care networks.	N/A	Expert opinion	Development of a conceptual framework for the evaluation of integrated palliative care networks.
Balmer et al. [87]	2011	Inter-organisational and inter-professional learning.	N/A	Descriptive study	Exploration of different alliance competencies.
Barceló et al. [83]	2010	Quality improvement collaborative.	10 public health centres.	Case-control study	Using collaborative learning to improve the quality of diabetes care.
Béland and Hollander [25]	2011	Integrated service delivery.	N/A	Review of literature	Models on integrated care delivery for the frail elderly.
Biro, Moreland, and Cowgill [20]	2003	Integrated care networks.	N/A	Descriptive study	Framework for developing a balanced scorecard to establish benchmarks.
Blackmore, Mecklenburg and Kaplan [26]	2011	Integrated service delivery.	N/A	Descriptive study	Collaborative efforts among providers, payers, and employers.
Squire, Cousins and Brown [62]	2009	Inter-organisational learning.	104 manufacturing firms.	Cross-sectional study	The effect of relational factors on knowledge transfer within cooperation.
Briner et al. [89]	2010	Clinical risk management.	N/A	Descriptive study	Development of a monitoring instrument for clinical risk management.

Castelnovo [41]	2005	Inter-organisational collaboration.	N/A	Expert opinion	The development of a conceptual model for an integrated system of local governments.
Chan, Chong and Zhou [42]	2012	Inter-organisational collaboration.	505 employees of Malaysia firms.	Cross-sectional study	The diffusion of electronic collaboration in supply chain management.
Choi and Ko [63]	2012	Inter-organisational learning.	119 employees of Korean firms.	Cross-sectional study	The relationship between Inter-organisational learning and electronic collaboration.
Clarke and Fuller [43]	2010	Inter-organisational collaboration.	N/A	Descriptive study	The development of collaborative strategic management model.
Cohen et al. [27]	2011	Integrated service delivery.	N/A	Descriptive study	The development of an integrated complex care model.
D'Amour et al. [86]	2008	Inter-professional and inter-organisational collaboration.	N/A	Descriptive study	The development of a model for inter-professional and inter-organisational collaboration.
DeMuro [16]	2011	Accountable Care Organisations	N/A	Expert opinion	Strategies for governing an accountable care organisation.
Dunlop and Holosko [44]	2005	Inter-organisational collaboration.	N/A	Descriptive study	The role and contribution of relational processes in inter-organisational partnerships.
Epping-Jordan et al. [90]	2004	Chronic Care Model.	N/A	Expert opinion	The development of framework which emphasizes community and policy aspects of improving care.
Evans and Alleyne [79]	2009	Inter-professional learning.	N/A	Expert opinion	The development of a knowledge transfer process model.
Evans and Baker [28]	2012	Integrated service delivery.	N/A	Expert opinion	The development of a framework to characterize the behaviours of actors within health systems.
Fann, Ell and Sharpe [29]	2012	Integrated service delivery.	N/A	Expert opinion	Identification of key components of integrated psychosocial services.
Faulkner and Laschinger [91]	2008	Structural and psychological empowerment of nurses.	282 nurses.	Cross-sectional study	The relationship between structural and psychological empowerment and perceived respect of nurses.

Fleury [21]	2006	Integrated care networks.	N/A	Expert opinion	The development of a typology of Integrated care networks.
Fryers, Young and Rowland [70]	2012	Inter-professional collaboration.	N/A	Descriptive study	The development of an evaluation framework for team coordination.
Gagliardi, Dobrowb and Wright [71]	2011	Inter-professional collaboration.	N/A	Review of literature	Exploration of inter-professional collaboration models.
Garriga [45]	2009	Inter-organisational collaboration.	N/A	Descriptive study	A framework to conceptualize structural and relational factors of stakeholder cooperation.
Gowen, Henagan and McFadden [92]	2009	Transformational leadership, knowledge management and quality management.	370 hospitals in the USA.	Cross-sectional study	Relation between transformational leadership, knowledge management and quality management on organisational performance.
Handfield et al. [46]	2009	Inter-organisational collaboration.	151 manufacturing and service firms in the UK.	Cross-sectional study	Relation between organisational entrepreneurship and supply management.
Hastie and Fahy [72]	2011	Inter-professional collaboration.	N/A	Descriptive study	Inter-professional interactions in birthing units.
Hirsch and Meyer [47]	2010	Inter-organisational collaboration.	N/A	Expert opinion	A framework to assess the behavioural aspects in an inter-organisational partnership.
Hudson [73]	2007	Inter-professional collaboration.	N/A	Expert opinion	Pessimism and optimism in professional integration.
Huerta, Casebeer and VanderPlaat [48]	2006	Inter-organisational collaboration.	N/A	Expert opinion	A framework to conceptualize inter-organisational relationships in health care.
Huotari [64]	2008	Inter-organisational learning.	N/A	Expert opinion	Development of a model for inter-organisational learning in a multi-actor network.
Huxham and Hibbert [65]	2008	Inter-organisational learning.	N/A	Descriptive study	A conceptualization of inter-organisational learning.
Jarvenpaa and Majchrzak [66]	2008	Inter-organisational learning.	104 security professionals in the USA.	Cross-sectional study	Assessment of knowledge-sharing in inter-organisational collaborations.
Knoben and Oerlemans [67]	2012	Inter-organisational learning.	400 South African firms.	Cross-sectional study	The relation between a sets of external actors and Inter-organisational knowledge links.
Kowalska [49]	2007	Inter-organisational collaboration.	N/A	Descriptive study	Exploration of the relation between health care financing and integration.

Kümpers et al. [88]	2006	Inter-organisational and inter-professional learning.	N/A	Descriptive study	Conceptualization of knowledge transfer in health care networks.
Leech, van Wyk and Uys [74]	2007	Inter-professional collaboration.	N/A	Descriptive study	Exploration of the role of community nurses in primary care clinics.
Légaré et al. [75]	2011	Inter-professional collaboration.	N/A	Descriptive study	Conceptualisation of inter-professional approach of shared discussion making in primary care.
Lough and Klevay [76]	2012	Inter-professional collaboration.	N/A	Expert opinion	The development of inter-professional collaboration model.
McGill and Santoro [50]	2004	Inter-organisational collaboration.	N/A	Expert opinion	Exploration of the resource and competitive interdependence between organisations.
Meijboom, Haan and Verheyen [22]	2004	Integrated care networks.	N/A	Expert opinion	Conceptualisation of economic organisation theory in health networks.
Minkman et al. [30]	2009	Integrated service delivery.	31 Dutch integrated care experts.	Review of literature and consensus procedure	Development of a quality management model for integrated care.
Minkman, Ahaus and Huijsman [31]	2009	Integrated service delivery.	31 Dutch integrated care experts.	Expert opinion	A framework for the development process of integrated care services.
Minkman et al. [32]	2011	Integrated service delivery.	84 care networks.	Cross-sectional study	Quality indicators to assess integrated care services.
Minott et al. [51]	2010	Inter-organisational collaboration.	N/A	Expert opinion	Exploration of a group employed model.
Morgan et al. [80]	2009	Inter-professional learning.	N/A	Descriptive study	Evaluation of a community-based medical education program.
Ngai, Jin and Liang [52]	2008	Inter-organisational collaboration.	N/A	Descriptive study	Conceptualization of inter-organisational Knowledge management.
Ngai, Chau and Chan [53]	2011	Inter-organisational collaboration.	N/A	Descriptive study	Exploration of the relationship between supply chain competence and supply chain agility on firm performance.
Nolan et al. [68]	2005	Inter-organisational learning.	N/A	Descriptive study	Evaluation of a framework to spread improvements in a health care setting.
Olckers, Gibbs and Duncan [81]	2007	Inter-professional learning.	N/A	Expert opinion	Conceptualisation of inter-professional learning of health professionals.

Olson, Balmer and Mejicano [54]	2011	Inter-organisational collaboration.	N/A	Descriptive study	Conceptualisation of success factors for inter-organisational collaboration in the health sector.
Paier and Scherngell [55]	2011	Inter-organisational collaboration.	191 organisations participating in research projects.	Cross-sectional study	Evaluation of features for Inter-organisational R&D collaborations.
Pettersen and Rokkan [56]	2006	Inter-organisational collaboration.	Companies in the French seafood industry.	Cross-sectional study	Conceptualization of buyer tolerance of conflict in international business relationships.
Phillips et al. [93]	2010	Clinical governance in primary care/ Other.	N/A	Review of literature	Exploration of the concept of clinical governance and the relation with quality and safety.
Pinto et al. [84]	2011	Quality improvement collaborative.	20 health organisations in the UK.	Cross-sectional study	The effect of situational factors on a quality improvement program.
Pomietto et al. [85]	2009	Quality improvement collaborative.	N/A	Descriptive study	Evaluation of a quality improvement project.
Reilly et al. [33]	2003	Integrated service delivery.	331 consultants in old age psychiatry in the UK and Ireland.	Cross-sectional study	Relation between integrated structures and services.
Robinson, Anning and Frost [82]	2005	Inter-professional learning.	N/A	Expert opinion	Conceptualization of inter-professional learning in a multi-agency team setting.
Rocha and Miles [57]	2009	Inter-organisational collaboration.	N/A	Expert opinion	Conceptualization of a collaborative entrepreneurship model for inter-organisational partnerships.
Sanders [58]	2007	Inter-organisational collaboration.	245 CEOs of manufacturing companies in the USA.	Cross-sectional study	Relationship between e-business technologies, organisational collaboration, and performance.
Schulz and Geithner [69]	2010	Inter-organisational learning.	N/A	Descriptive study	Exploration of the development of inter-organisational learning networks.
Shields et al. [17]	2011	Accountable Care Organisations.	N/A	Descriptive study	Integrating of independent physicians into an accountable care organisation.
Shields [18]	2011	Accountable Care Organisations.	N/A	Expert opinion	Exploration of success factors for an accountable care organisation.
Sicotte, D'Amour and Moreault [77]	2002	Inter-professional collaboration in primary care.	343 programme co-ordinators within a community health centre.	Cross-sectional study	Exploration of success factors for inter-professional collaboration in community health centres.

Speir et al. [59]	2009	Inter-organisational collaboration.	N/A	Descriptive study	Evaluation of a model for regional collaboration in health care.
Stock, Reece and Cesario [78]	2004	Inter-professional collaboration.	N/A	Descriptive study	Description of an interdisciplinary model for geriatric patients.
Strandberg-Larsen et al. [34]	2010	Integrated service delivery.	976 general practitioners in the US and Denmark.	Cross-sectional study	Exploration of clinicians' perceptions of clinical integration in two different health sectors.
Thompson et al. [94]	2003	Process optimisation in the care chain.	N/A	Descriptive study	Description of the implementation of Toyota production system method in a health system.
Ueoka [35]	2008	Health care Improvement in conflict areas.	N/A	Descriptive study	Description of a health care improvement model in conflict areas.
Vaccaro, Parente and Veloso [60]	2010	Inter-organisational collaboration.	113 senior managers in the Brazilian automobile industry.	Cross-sectional study	The effect of knowledge management tools on the performances of business units in inter-organisational relationships.
Visschedijk et al. [36]	2003	Integrated service delivery.	N/A	Expert opinion	Conceptualization of the integration of leprosy services into the general health services.
Wan and Wang [23]	2003	Integrated care networks.	100 integrated health care networks in the US	Retrospective cohort study	The effect of integration on performance in health care networks.
Wells and Weiner [61]	2007	Inter-organisational collaboration.	N/A	Descriptive study	Exploration of cooperative evolution in community health centres.
Zou et al. [37]	2012	Integrated service delivery.	N/A	Descriptive study	Exploration of factors that influence the integration of health services.

N/A: Not applicable

CHAPTER 4

TOWARDS AN INTERNATIONAL TAXONOMY OF INTEGRATED PRIMARY CARE: A DELPHI CONSENSUS APPROACH

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ABSTRACT

Background

Developing integrated service models in a primary care setting is considered an essential strategy for establishing a sustainable and affordable health care system. The Rainbow Model of Integrated Care (RMIC) describes the theoretical foundations of integrated primary care. The aim of this study is to refine the RMIC by developing a consensus-based taxonomy of key features.

Methods

First, the appropriateness of previously identified key features was retested by conducting an international Delphi study that was built on the results of a previous national Delphi study. Second, categorisation of the features among the RMIC integrated care domains was assessed in a second international Delphi study. Finally, a taxonomy was constructed by the researchers based on the results of the three Delphi studies.

Results

The final taxonomy consists of twenty-one key features distributed over eight integration domains which are organised into three main categories: scope (person-focused vs. population-based), type (clinical, professional, organisational and system) and enablers (functional vs. normative) of an integrated primary care service model.

Conclusions

The taxonomy provides a crucial differentiation that clarifies and supports implementation, policy formulation and research regarding the organisation of integrated primary care. Further research is needed to develop instruments based on the taxonomy that can reveal the realm of integrated primary care in practice.

BACKGROUND

Developing integrated service delivery in a primary care setting is considered an important strategy to establish a more sustainable and affordable health care system [1, 2]. Despite the increasing popularity of organising integrated service models, a solid scholarly exploration of the concept of integrated primary care is limited [3]. Throughout this paper we refer to integrated primary care as ambulatory care settings in which a network of multiple professionals and organisations across the health and social care system provide accessible, comprehensive, and coordinated services to a population in a community. Existing integrated care models lack a primary care perspective that is based on an encompassing inter-sectorial system approach with a distinct community and socio-political focus [3, 4]. Consequently, there is a need to develop a common terminology and typology for integrated primary care in order to facilitate program implementation, policy formulation and research.

In a previous publication, we introduced the Rainbow Model of Integrated Care (RMIC) as a guide to understanding the complex and comprehensive nature of integrated primary care [3]. The model distinguishes six domains of integrated care (clinical, professional, organisational, system, functional and normative integration) and two primary care guiding principles (person-focused and population-based). The model is considered useful for understanding the complexity of integrated service delivery as a whole [5]. Based on these theoretical foundations of the RMIC, a draft taxonomy was developed that specified underlying key features of the six integrated care domains [6].

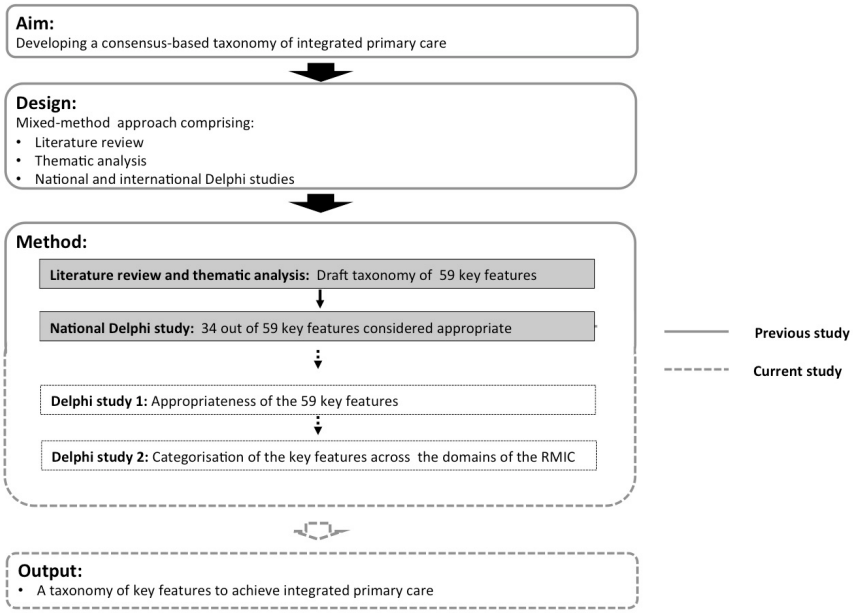
In our previous research, we conducted a Delphi study among a panel of experts from The Netherlands in order to investigate the appropriateness of the key features to achieve integrated primary care. The results of this Delphi study indicated that further work was needed to establish a common operational consensus regarding our taxonomy. The purpose of the present study is to further refine our taxonomy by testing it against international expert opinions in the field of integrated primary care. We aim to contribute to the ongoing debate of defining and specifying integrated care by addressing the following objectives:

1. Investigate the appropriateness of the key features to achieve integrated primary care among a panel of international experts.
2. Test the categorisation of the key features across the domains of the RMIC against international expert opinions.
3. Develop a consensus-based taxonomy derived from the results of the previous and present studies.

METHODS

In the previous study, we developed a draft taxonomy of fifty-nine key features based on a literature review and a thematic analyses method [6]. We performed a national Delphi study as a first step to deriving an operational consensus about our taxonomy. Continuing this line of

research, for this current study, we developed two international Delphi studies to investigate the appropriateness of the taxonomy to achieve integrated primary care (see Figure 1). First, the appropriateness of the original fifty-nine key features was assessed by a panel of international experts. Second, another panel of international experts assessed the categorisation of the key features and their distribution across the domains of the RMIC. Finally, a consensus-based taxonomy was developed by using the results of all three Delphi studies (the previous Delphi study and the international Delphi studies presented in this article).



Partly adopted from Valentijn et al. (2014) [6]

Figure 1: Study design

Delphi consensus process

Two separate modified Delphi studies were conducted to: 1) investigate the appropriateness of the key features and, 2) test the categorisation across the domains of the RMIC. The modified Delphi methodology is a research technique designed to obtain opinions from experts through the use of a self-administrated questionnaire (Round 1) and of a physical meeting of experts (Round 2) to discuss the ratings of Round 1 [7]. Given the polymorphous nature of integrated care [4], the physical meetings enabled the experts to clarify each other's perspectives on integrated care [8].

Selection of participants

For each international Delphi study, a purposive sampling strategy was used to identify experts with experience in practice, science or policy in the deployment of integrated service models

in a primary care setting. Potential experts were nominated using the following criteria: 1) scientific (performing research) experience and/or 2) practical (working in a professional or service organisation) experience regarding the organisation of integrated primary care. We attempted to balance the number of potential experts from each category in order to ensure each was represented in both studies. We did not include experts with an explicit policy background (e.g. health insures) or patients in order to minimalize conflict of interest during the face-to-face meeting of the second Delphi round [6]. For example, the presence of policymaker or health insures could influence the (strategic) behaviour of the practice experts, as they are (financially) dependent of these stakeholders for the continuity of their practices. Experts who met the selection criteria were e-mailed an invitation with information on the research aims and details of the Delphi study. Only those who agreed to participate in both the initial online self-administrated questionnaire and the second face-to-face meeting were included. Experts who already participated within one of the previous Delphi studies were excluded.

Delphi study 1

The first international Delphi study was conducted to test the appropriateness of the 59 features at an international level in order to augment the research we conducted on the appropriateness of the features in the previous national Delphi study. Thirty-seven international experts from an a priori list of participants of the World Congress on Integrated Care (2013) in Singapore [9] were approached by e-mail and invited to participate. During Round 1, the experts received a link to an online questionnaire. They were asked to rate the appropriateness of each feature to achieve integrated primary care on a nine-point Likert-scale, ranging from 1 (completely irrelevant) to 9 (extremely relevant). Experts were asked to comment on any of the features, to suggest possible rephrasing and to highlight any features that may have been missed in the initial list. Two e-mail reminders were sent to non-responders.

In Round 2, a face-to-face meeting of the expert panel took place during the World Congress on Integrated Care. The meeting was chaired by one member of the research team (HV). The goal of the meeting was to discuss the results of Round 1 and, after the discussion, to reassess the value of the appropriateness of the features to achieve integrated primary care. Based on the results of Round 1, a summary report was provided to the experts at the meeting with the following key feedback information for each feature: 1) respondents' own ratings, 2) median agreement rating, 3) summary of qualitative comments, and 4) whether a consensus was achieved at Round 1. Because of time, during the second round, we decided to only discuss the features that were not considered appropriate in the first round.

To begin the discussion over a disputed feature value, panel members who had rated the disputed feature with either its highest and lowest scores were asked to clarify their considerations. Next, a short discussion among all group members took place to explore if differences were due to real disagreement or to a misunderstanding or misinterpretation of the feature [8]. Finally, the experts were asked to individually rate the feature once again on their summary report. During the discussion, notes were taken by two observers.

Delphi study 2

A second international Delphi study was conducted to: 1) refine the descriptions of the domains of the RMIC and 2) categorise the features under one of the domains of the RMIC. Only key features that were considered appropriate within one of the previous Delphi studies (national and international) were included in the final Delphi study. Thirty-six experts from an a priori list of participants at the 14th International Conference on Integrated Care (2014) in Brussels [9, 10] were invited by e-mail. In Round 1, the experts received a link to an online questionnaire and were asked to categorise each feature into one of the domains of the taxonomy: 1) clinical integration, 2) professional integration, 3) organisational integration, 4) system integration, 5) functional integration, 6) normative integration, and 7) person-focused and population-based care. Two e-mail reminders were sent to non-responders.

In the second round, a face-to-face expert panel meeting took place. A member of the research team (MB) chaired this meeting and facilitated the panel discussion. Based on the results of Round 1, a summary report was provided to the experts with the following key feedback information: 1) respondents' own categorisation of each feature, 2) whether consensus was achieved regarding the categorisation in Round 1, and 3) a summary of qualitative comments. First, an iterative group discussion was conducted about the descriptions of the seven domains of the draft taxonomy. Second, the features that did not result in a consensus regarding their categorisation were discussed. Next, a short discussion among all group members took place. Finally, the experts were asked to once again individually categorise the features on which no consensus was reached in the first round. During the discussion, notes were taken by two observers.

Synthesis of the results

Based on the results of the previous and current Delphi studies, a final version of the taxonomy was constructed. The research team synthesised the results and comments provided by the experts to produce a final taxonomy of features. To be initially included, features had to meet the following sequential eligibility criteria: 1) features had to be considered appropriate in Delphi study 1 as well as the national Delphi study and 2) a consensus had to be reached regarding categorisation based on the results of Delphi study 2 (see Figure 2). Thereafter, three authors (PV, MB and IB) independently assessed the compiled taxonomy of features. To ensure a comprehensive analysis, the authors checked if each domain contained sufficient key features and iterative revisions were made. Features that were identical or nearly identical were aggregated. All authors gave feedback on the final taxonomy to refine the descriptions of the key features. PV summarised the feedback and the taxonomy accordingly.

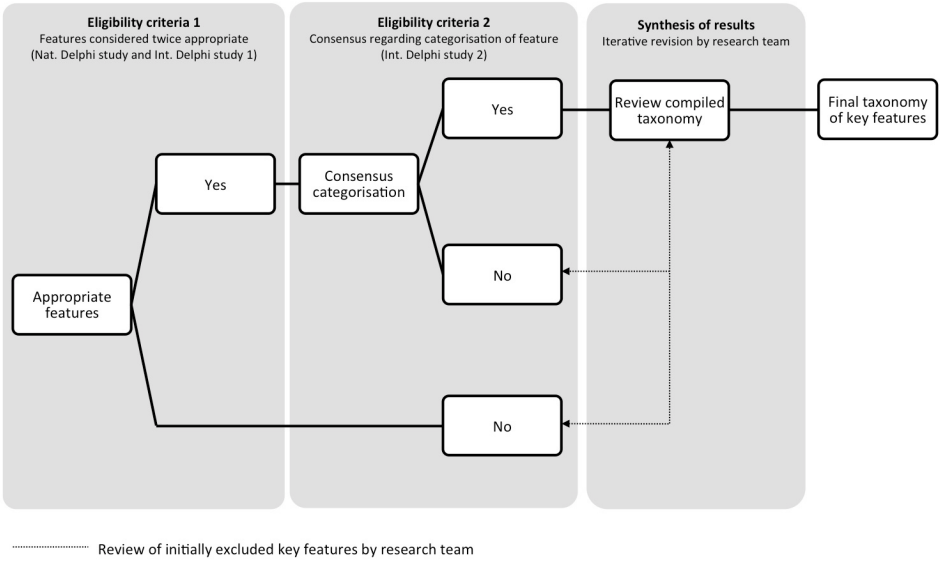


Figure 2: Flowchart of the synthesis of results

Data analysis

Criteria of the RAND UCLA appropriateness method were used to analyse the data from the previous national Delphi study and the current Delphi study 1 [8]. We categorized the overall panel median as follows: 1-3 as inappropriate, 4-6 as equivocal and 7–9 as appropriate. Agreement signified that ≥ 70% of panellists' ratings were within the same 3-point region (that is, 1–3, 4–6, or 7–9) as the observed median. A feature was defined as "appropriate" with an overall panel median score of ≥ 7 and a level of agreement of ≥ 70% within the 3-point region 7–9. A panel median of 4-6 or median with consensus of ≤ 70% within the same 3-point region was defined as "equivocal". A feature with a panel median of 1-3 and a level of agreement of ≥ 70% within the 3-point region 1-3, was defined as "inappropriate". The decision rules used in the national Delphi study and international Delphi study 1 are shown in Table 1. During Delphi study 1, PV and HV tabulated and discussed qualitative responses after Round 1, and circulated the results to the experts for Round 2. For international Delphi study 2, agreement signified that ≥ 60% of panellists categorised a feature within the same domain. During Delphi study 2, PV and MB tabulated and discussed qualitative responses after Round 1 and circulated the results to the participants for Round 2. Quantitative analysis was done using Statistical Package for the Social Sciences (SPSS) version 21 for Windows (IBM Statistics).

Table 1: Decision rules national and international Delphi study 1

		Median (1-3)	Median (4-6)	Median (7-9)
Round 1	Agreement (≤ 70 %)	Equivocal; discussion Round 2	Equivocal; discussion Round 2	Equivocal: discussion Round 2
	Agreement (≥ 70%)	Inappropriate; excluded after Round 1	Equivocal; discussion Round 2	Appropriate; included after Round 1
Round 2	Agreement (≤ 70 %)	Equivocal	Equivocal	Equivocal
	Agreement (≥ 70%)	Inappropriate	Equivocal	Appropriate

Ethics

This study has conformed to the principles embodied in the Declaration of Helsinki. All experts approved their participation by an informed consent. As this study does not involve patients or study subjects, according to the Dutch Medical Research in Human Subjects Act (WMO), this is exempt from ethical approval in The Netherlands.

RESULTS

For Delphi study 1, we asked thirty-seven experts to participate; sixteen were willing to participate, sixteen completed Round 1 and fifteen completed Round 2. Participants had experience with integrated care in eleven different countries (Australia, Austria, Belgium, El Salvador, Russia, Singapore, Spain, Sweden, The Netherlands, UK and USA). For Delphi study 2, thirty-six people were invited. Eight experts completed both rating rounds. The experts gained their experience with integrated care in five different countries (Australia, Belgium, Germany, New Zealand and The Netherlands). The main reason reported by experts for not participating in the international Delphi studies 1 or 2 was their lack of availability for the second round face-to-face meeting. Table 2 describes the characteristics of the participants of the two Delphi studies.

Table 2: Participants' characteristics of the two international Delphi studies

	Delphi study 1		Delphi study 2	
	Round 1	Round 2	Round 1	Round 2
Number of participants	16	15	8	8
Dominant background, n (%)				
Practical	7 (44)	6 (40)	4 (50)	4 (50)
Scientific	9 (56)	9 (60)	4 (50)	4 (50)
Years of experience, mean (SD), range	9.5 (6.7), 3-25	9.5 (6.9), 3-25	13.4 (8.6), 4-25	13.4 (8.6), 4-25
< 5	2 (12)	2 (13)	2 (25)	2 (25)
5-10	10 (63)	9 (60)	2 (25)	2 (25)
>10	4 (25)	4 (27)	4 (50)	4 (50)
Experience gained in country, n				
Australia	1	-	2	2
Austria	1	1	-	-

Belgium	2	2	1	1
El Salvador	1	1	-	-
Germany	-	-	1	1
New Zealand	-	-	2	2
Russia	1	1	-	-
Singapore	5	5	-	-
Spain	1	1	-	-
Sweden	1	1	-	-
The Netherlands	1	1	2	2
United Kingdom	1	1	-	-
United States of America	1	1	-	-

Delphi study 1

After the first round, the international experts of Delphi study 1 considered twenty-five of the fifty-nine proposed features of the taxonomy appropriate. (The overall panel median was between 7 and 9 with a consensus ≥ 70% within this 3-point region, see Table 3, columns 3 and 4). Thirty-four features were rated as equivocal (overall panel median between 4 and 6 or median with consensus ≤ 70% within the same 3-point region). Furthermore, the experts suggested five new features during this round (see Table 3, column 1): incentive systems (no. 43), community participation (no. 44), universal health coverage (no. 45), single point of access (no. 46) and alignment of regulatory frameworks (no.47). After reviewing the results, the research team initially categorised the newly added features within the domain of system integration of the draft taxonomy. This addition led to a list of sixty-four key features.

In the second round, the thirty-four equivocal features were discussed during the face-to-face meeting. This resulted in an extra seventeen features rated as appropriate, see Table 3, columns 5-7. The other seventeen features remained equivocal after the second round. With regard to the five newly added features, three were rated as appropriate (no. 43, no. 44 and no. 47) and the remaining two (no. 45 and no. 46) as equivocal. To summarise, forty-five features were considered appropriate (twenty-five in the first round and twenty in the second round), while nineteen features were considered equivocal (see Table 3, column 7).

Table 3: Results of the national Delphi and international Delphi study 1 and 2

Initial taxonomy of key features	Identification appropriateness and categorisation of key features									
Literature review and thematic analysis	National Delphi study	Delphi study 1					Delphi study 2			
		Round 1 (n=16)		**Round 2** (n=15)			**Round 1**(n=8)	**Round 2** (n=8)		
Initial taxonomy of key features[#]	Final consensus[#]	Panel median (30th and 70th percentile)	Agreed (%)	Panel median (30th and 70th percentile)	Agreed (%)	Final consensus	Categorisation	Categorisation	Agreed (%)	Final consensus
Clinical integration										
1. Centrality of client needs	**Appropriate**	8 (8-8.9)	93.8	N/A	N/A	**Appropriate**	PP		75	**Yes**
2. Case management	**Appropriate**	8 (7.1-8)	75	N/A	N/A	**Appropriate**	CI		62.5	**Yes**
3. Patient education	Equivocal	7 (6-8)	62.5	8 (7-8.2)	80	**Appropriate**	PP		75	**Yes**
4. Client satisfaction	Equivocal	8 (7.1-8)	87.5	N/A	N/A	**Appropriate**	PP		62.5	**Yes**
5. Continuity	**Appropriate**	8.5 (8-9)	93.8	N/A	N/A	**Appropriate**	CI		62.5	**Yes**
6. Interaction between professional and client	**Appropriate**	7 (6.1-7.9)	68.8	7 (7-8)	86.7	**Appropriate**		CI	62.5	**Yes**
7. Individual multidisciplinary care plan	**Appropriate**	8 (7-8.9)	93.8	N/A	N/A	**Appropriate**	CI		62.5	**Yes**
8. Information provision to clients	Equivocal	6.5 (5-7)	50	7 (5.8-8)	66.7	Equivocal	N/A	N/A	N/A	N/A
9. Comprehensive care services[aa]	**Appropriate**	7 (6-8)	62.5	8 (7-9)	80	**Appropriate**			DA	No
10. Client participation	Equivocal	8 (7-8)	75	N/A	N/A	**Appropriate**	PP		62.5	**Yes**
11. Population needs	**Appropriate**	8 (7.1-9)	81.3	N/A	N/A	**Appropriate**	PP		87.5	**Yes**
12. Self-management[a]	Equivocal	7 (6.1-7.9)	68.8	8 (7-8)	93.3	**Appropriate**	PP		75	**Yes**

Professional integration										
13. Inter-professional education	**Appropriate**	7 (6-7.9)	62.5	7 (6.8-8)	73.3	**Appropriate**		PI	62.5	**Yes**
14. Shared vision between professionals	**Appropriate**	8 (8-9)	93.8	N/A	N/A	**Appropriate**		NI	75	Yes
15. Agreements on interdisciplinary collaboration	**Appropriate**	7 (7-7.9)	75	N/A	N/A	**Appropriate**		PI	87.2	**Yes**
16. Multidisciplinary guidelines and protocols	**Appropriate**	7.5 (7-8)	75	N/A	N/A	**Appropriate**			DA	No
17. Inter-professional governance	**Appropriate**	7 (7-7.9)	75	N/A	N/A	**Appropriate**		OI	62.5	**Yes**
18. Interpersonal characteristics[a]	Equivocal	7 (6-7.9)	56.3	7 (6-7)	53.3	Equivocal	N/A	N/A	N/A	N/A
19. Professional leadership[a]	Equivocal	7.5 (6.1-8)	68.8	8 (6.8-9)	73.3	**Appropriate**			DA	No
20. Environmental awareness	Equivocal	5 (5-6)	75	6 (5-7)	53.3	Equivocal	N/A	N/A	N/A	N/A
21. Value creation for the professional	**Appropriate**	7 (6-7)	62.5	8 (7-9)	100	**Appropriate**	PI		75	**Yes**
22. Performance management	Equivocal	7 (7-8)	75	N/A	N/A	**Appropriate**		PP	87.5	**Yes**
23. Creating interdependence between professionals[a]	Equivocal	7 (6-8)	62.5	7 (7-8)	86.7	**Appropriate**	PI		62.5	**Yes**
Organisational integration										
24. Value creation for organisation	Equivocal	8 (7-8)	75	N/A	N/A	**Appropriate**			DA	No
25. Inter-organisational governance	**Appropriate**	8 (8-9)	81.3	N/A	N/A	**Appropriate**	OI		75	**Yes**
26. Informal managerial network	Equivocal	6 (6-7)	43.8	5 (3-6)	53.3	Equivocal	N/A	N/A	N/A	N/A

27.	Interest management[a]	**Appropriate**	7 (6.1-7.9)	68.8	7 (7-7.2)	86.7	**Appropriate**			DA	No
28.	Performance management[a]	**Appropriate**	7 (6-7)	62.5	6 (6-7)	46.7	Equivocal	OI		62.5	**Yes**
29.	Population needs as binding agent	**Appropriate**	8 (7-8)	75	N/A	N/A	**Appropriate**	PP		75	**Yes**
30.	Organisational features[a]	Equivocal	6.5 (5.1-7)	31.3	6 (4-7)	46.7	Equivocal	N/A	N/A	N/A	N/A
31.	Inter-organisational strategy	**Appropriate**	7.5 (7-8)	75	N/A	N/A	**Appropriate**	OI		62.5	**Yes**
32.	Managerial leadership	**Appropriate**	7 (6-8)	62.5	8 (7-9)	86.7	**Appropriate**			DA	No
33.	Learning organisations	**Appropriate**	7.5 (7-8)	81.3	N/A	N/A	**Appropriate**		FI	62.5	**Yes**
34.	Co-location policy[a]	Equivocal	5.5 (5-6)	62.5	6 (4.8-7)	40	Equivocal	N/A	N/A	N/A	N/A
35.	Skills management[a]	**Appropriate**	7 (6-7)	56.3	7 (6-7)	66.7	Equivocal	PI		62.5	**Yes**
36.	Creating interdependence between organisations[a]	Equivocal	7 (6-8)	56.3	7 (7-8)	80	**Appropriate**	OI		62.5	**Yes**
System integration											
37.	Social value creation[a]	Equivocal	8 (7-8)	75	N/A	N/A	**Appropriate**		PP	75	**Yes**
38.	Available resources	Equivocal	6 (5-7)	43.8	6 (4.8-7)	53.3	Equivocal	N/A	N/A	N/A	N/A
39.	Population features	Equivocal	6 (4.1-7)	31.3	7 (5.6-8)	60	Equivocal	N/A	N/A	N/A	N/A
40.	Stakeholder management	**Appropriate**	8 (7-8.9)	87.5	N/A	N/A	**Appropriate**			DA	No
41.	Good governance	Equivocal	7 (6.1-7)	68.8	7 (7-8)	86.7	Appropriate			DA	No
42.	Environmental climate	Equivocal	6 (6-7)	50	7 (7-8.2)	80	**Appropriate**	SI		75	**Yes**
43.	Incentive systems[b]	N/A	N/A	N/A	8 (8-9)	93.3	**Appropriate**		FI	87.5	**Yes**
44.	Community participation[b]	N/A	N/A	N/A	8 (7-8)	93.3	**Appropriate**			DA	No
45.	Universal health coverage[b]	N/A	N/A	N/A	7 (5-7)	66.7	Equivocal	N/A	N/A	N/A	N/A

46. Single point of access[b]	N/A	N/A	N/A	6 (5-7)	53.3	Equivocal	N/A	N/A	N/A	N/A
47. Alignment of regulatory frameworks[b]	N/A	N/A	N/A	7 (7-8)	93.3	**Appropriate**		SI	75	**Yes**
Functional integration										
48. Human resource management[a]	Equivocal	6.5 (6-7)	37.5	6 (4-7)	46.7	Equivocal	N/A	N/A	N/A	N/A
49. Information management	**Appropriate**	8 (7.1-9)	81.3	N/A	N/A	**Appropriate**	FI		62.5	**Yes**
50. Resource management	Equivocal	6 (5-7)	50	5 (3.8-7)	40	Equivocal	N/A	N/A	N/A	N/A
51. Support systems and services	Equivocal	5.5 (5-6)	68.8	5 (3-6)	60	Equivocal	N/A	N/A	N/A	N/A
52. Service management	**Appropriate**	6 (6-7)	43.8	6 (6-7)	40	Equivocal		FI	100	**Yes**
53. Regular feedback of performance indicators[a]	**Appropriate**	7 (6.1-8)	68.8	7 (7-9)	86.7	**Appropriate**		FI	87.5	**Yes**
Normative integration										
54. Collective attitude	**Appropriate**	7 (6-8)	62.5	7 (6-8)	66.7	Equivocal	NI		75	**Yes**
55. Sense of urgency	**Appropriate**	7 (6.1-8)	68.8	7 (5.8-8)	66.7	Equivocal			DA	No
56. Reliable behaviour	**Appropriate**	7.5 (7-8)	81.3	N/A	N/A	**Appropriate**		NI	62.5	**Yes**
57. Conflict management	Equivocal	7 (6.1-8)	68.8	8 (7-8.2)	80	**Appropriate**		OI	62.5	**Yes**
58. Visionary leadership[a]	**Appropriate**	7.5 (6.1-8.9)	68.8	9 (8-9)	86.7	**Appropriate**		NI	75	**Yes**
59. Shared vision	**Appropriate**	7.5 (7-8)	87.5	N/A	N/A	**Appropriate**	NI		75	**Yes**
60. Quality features of the informal collaboration	Appropriate	7 (6-8)	62.5	7 (6.8-8)	73.3	**Appropriate**			DA	No
61. Linking cultures	Appropriate	7 (7-8)	75	N/A	N/A	**Appropriate**	NI		75	**Yes**
62. Reputation	Inappropriate	5.5 (5-7)	50	6 (3.8-7)	40	Equivocal	N/A	N/A	N/A	N/A

63.	Transcending domain perceptions	Appropriate	8 (7.1-9)	93.8	N/A	N/A	**Appropriate**		DA	No
64.	Trust	Appropriate	8 (8-9)	87.5	N/A	N/A	**Appropriate**	OI	75	**Yes**

Abbreviations: N/A, not applicable; DA, disagreement; CI, clinical integration; PI, professional integration; OI, organisational integration; SI, system integration; FI, functional integration; NI, normative integration; PP, person-focused and population-based care.

[#] Results are adapted from Valentijn et al. (2015) [6]

[a] Adjustment description Delphi study 1

[aa] Refinement description Delphi study 2

[b] Newly added key features after Round 1 of Delphi study 2

Delphi study 2

Fifty features were included in the international Delphi study 2, because they were considered appropriate within the previous national Delphi study (see Table 3, column 2) or international Delphi study 1 (see Table 3, column 7). In the first round of international Delphi study 2, the panel members agreed (≥ 60%) on the categorisation of twenty-two of the fifty features under one of the seven domains of the taxonomy (see Table 3, column 8).

In the second round, the panel members first discussed the descriptions of the seven domains of the taxonomy. The comments on the descriptions of the domains of the taxonomy and changes made in response to them are summarised in Table 4. Subsequently, the panel members discussed the categorisation of the remaining twenty-eight features that were equivocal after the first round. This resulted in an additional sixteen features that experts reached an agreement on regarding the categorisation under one of the seven domains of the taxonomy. The remaining twelve (28 minus 16) features were not agreed upon with regard to their categorisation (see Table 3, column 9).

Table 4: Statements by experts of international Delphi study 2 on initial descriptions of domains of taxonomy, highlighting main comments and final descriptions

Initial domains and descriptions#	Main comments	Adjusted descriptions
1. **Clinical integration:** The coordination of person-focused care in a single process across time, place and discipline.	• Add that integration is needed for a complex (multi-problem) at stake • Clinical is too strict for the health and social aspects of health (service delivery)	1. **Clinical or service integration:** Coordination of person-focused care for a complex need at stake in a single process across time, place and discipline.
2. **Professional integration:** Inter-professional partnerships based on shared competences, roles, responsibilities and accountability to deliver a comprehensive continuum of care to a defined population.	• Add shared understanding among professional groups, since this is of crucial importance for professional integration • Rephrase defined into well-described population	2. **Professional integration:** Inter-professional partnerships based on a shared understanding of competences, roles, responsibilities and accountability to deliver a comprehensive continuum of care to a well-described population.
3. **Organisational integration:** Inter-organisational relationships (e.g. contracting, strategic alliances, knowledge networks, mergers), including common governance mechanisms, to deliver comprehensive services to a defined population.	• Use the structure of the description of professional integration to describe organisational integration • The word integration is problematic, as it is the end of the continuum • Add collaborative accountability, since this is essential for organisational integration • Rephrase "well defined" as "well-described"	3. **Organisational integration:** Inter-organisational partnerships (e.g. agreements, contracting, strategic alliances, knowledge networks, mergers) based on collaborative accountability and shared governance mechanisms, to deliver a comprehensive continuum of care to a well-described population.

4.	**System integration:** A horizontal and vertical integrated system, based on a coherent set of (informal and formal) rules and policies between care providers and external stakeholders for the benefit of people and populations.	• Remove horizontal and vertical integration because it does not clearly describe and is too complex to understand • Generally it is difficult to differentiate between organisational and system integration • Add the political influence in the description, since that is the essence of system integration • Also add that system integration has to facilitate the other integration mechanisms such as organisational and professional integration	4. **System integration:** Coherent set of (informal and formal) political arrangements to facilitate professionals and organisations to deliver a comprehensive continuum of care for the benefit of people and populations.
5.	**Functional integration:** Key support functions and activities (i.e. financial, management and information systems) structured around the primary process of service delivery, to coordinate and support accountability and decision making between organisations and professionals to add overall value to the system.	• Add that functional integration is the technical enabler for integrated (primary) care • Add that communication and feedback mechanism is aimed at facilitating decision making	5. **Functional integration:** Supporting communication mechanisms and tools (i.e. financial, management and information systems) structured around the primary process of service delivery, to provide optimal information as a feedback mechanism for decision support between organisations, professional groups and individuals.
6.	**Normative integration:** The development and maintenance of a common frame of reference (i.e. shared mission, vision, values and culture) between organisations, professional groups and individuals.	• Add that normative integration is the cultural enabler for integrated (primary) care • Add mutual respect of cultural frame of references • Add that the shared goals should be aimed integrated primary care guiding principles: person-focused and population-based care	6. **Normative integration:** Mutually respected cultural frame of reference (i.e. shared mission, vision, values and behaviour) between organisations, professional groups and individuals to achieve shared goals towards person-focused and population based care.

7. **Person-focused and population based care:** Based on the needs and health characteristics of people and populations care is coordinated across professionals, organisations and support systems.	• Distinguish between the person-focused and population-based domain within the final taxonomy • Add that the added value is achieving the Triple Aim together	7. **Person-focused and population based care:** Based on the needs of people and populations, care is coordinated across professionals, organisations and support systems in order to achieve the triple aim (improving individual experience of care, the health of the population and reducing the costs per capita)

[#] Initial domains and descriptions are partially adapted from Valentijn et al. (2013) [3], and adjusted descriptions are based on the comments from the expert panel of international Delphi study 2.

Synthesis of results

During Delphi study 2, it appeared that our final taxonomy to describe an integrated primary care service model could be organised into three main categories: scope, type and enablers. The experts indicated that a distinction should be made between the individual (person-focused care) and population (population-based care) objectives to describe the scope of an integrated primary care initiative (see also Table 4). Furthermore, the experts indicated that the clinical, professional, organisational and system domains of our draft taxonomy could be used to describe the various types of integration processes. Finally, the qualitative comments of the experts revealed that functional and normative domains of our taxonomy are, respectively, the essential technical and cultural enablers for achieving integrated primary care. Therefore, we organised our final taxonomy into these three corresponding categories: 1) scope, 2) type, and 3) enablers of integrate primary care. Based on the comments made during Delphi study 2, the research team split the person-focused and population-based domain, resulting in a total of eight domains. A graphic representation of the final taxonomic structure is presented in Figure 3.

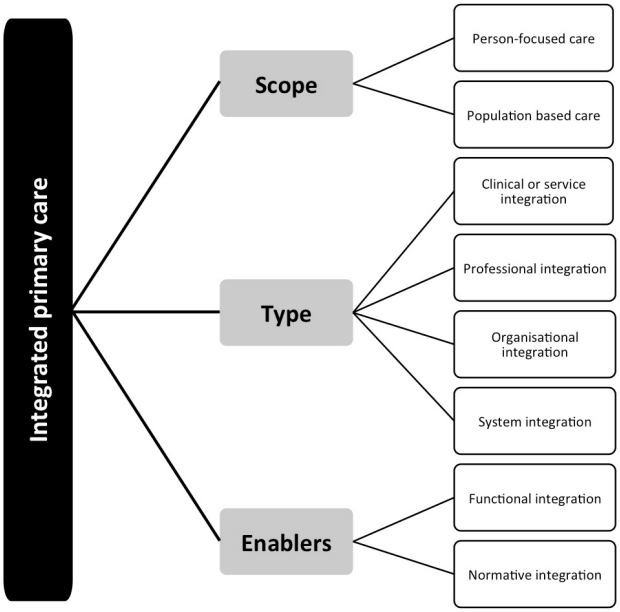


Figure 3: Final taxonomic structure of integrated primary care

The final taxonomic structure of eight domains was used to select and categorise the underlying key features. First, the features that were considered appropriate in the previous national Delphi study [6] as well as the current international Delphi study 1 were selected. This resulted in the selection of 29 features (see also Figure 4). Second, the selected features were categorised

within one of the domains of the taxonomy following the results of international Delphi study 2. Twenty-two features could be categorised within one of the eight domains. Third, the compiled taxonomy of twenty-two key features was reviewed by three authors (PV, MB and IB) on comprehensiveness per domain. The preliminary taxonomy did not contain any features within the system integration domain. A universal judgement was made by the three reviewers to add the features environmental climate (Table 3, no. 42) and alignment of regulatory framework (Table 3, no. 47) to the system integration domain because the categorisation reached consensus during Delphi study 1 and both features were considered appropriate during Delphi study 2. Finally, the three reviewers decided to merge the features population needs (Table 3, no.11) and population needs as binding agent (Table 3, no. 29) within the population based domain, inter-professional governance (Table 3, no. 17) and inter-organisational governance (Table 3, no. 25) within the organisational domain, and shared vision between professionals (Table 3, no. 14) and shared vision (Table 3, no. 59) within the normative domain due to similar content. The resulting taxonomy of twenty-one key features is shown in Table 5.

Table 5: Final taxonomy of key features

Main categories and domains	Description
Scope of integrated care	
Person-focused care	
Centrality of client needs	The principle of integrated service delivery is to address the needs of individual clients in terms of medical, psychological and social aspects of health
Population based care	
Centrality of population needs [b]	The principle of integrated service delivery is to address the dominant needs of well-defined populations
Type of integration processes	
Clinical integration	
Case management	Coordination of care for clients with a high risk profile (e.g. identifying risks, developing policies and guidance)
Continuity	Integrated service delivery aims to provide fluid the processes of care delivery for an individual client
Interaction between professional and client	Attitude and behavioural characteristics between professional and client regarding all health needs of the client
Individual multidisciplinary care plan	Implementation and application of a multidisciplinary care plan at the individual client level
Professional integration	
Inter-professional education	Inter-professional education for professionals focused on interdisciplinary service delivery and collaboration
Agreements on interdisciplinary collaboration	Agreements on the establishment of interdisciplinary service delivery and collaboration between the professionals
Value creation for the professional	The value added by the integrated service delivery approach for the individual professional
Organisational integration	
Inter-organisational governance [b]	The governance of the integrated service model is focused on openness, integrity and accountability between the involved organisations and professionals (e.g. joint accountability, appeal on pursued policies and responsibilities)
Inter-organisational strategy	Collective elaborated strategy between the organisations involved in the integrated service model
Trust	The extent to which those involved in the integrated service model trust each other
System integration	
Alignment of regulatory frameworks [a]	Alignment of regulatory frameworks for teamwork, coordination and continuity of care
Environmental climate [a]	Political, economic and social climate in the environment of the integrated service model (e.g. market characteristics, regulatory framework, and competition)
Enablers for integration	
Functional integration	
Learning organisations	Collective learning power between the organisations involved in the integrated service model (e.g. joint research and development programs)

Information management	Aligned information management systems within the integrated service model (e.g. monitoring and benchmarking systems)
Regular feedback of performance indicators	Regular feedback of performance indicators for quality improvement and self-reflection
Normative integration	
Shared vision [b]	Collectively shared long-term vision among the people who are involved in the integrated service model
Reliable behaviour	The extent to which the agreements and promises within the integrated service model are fulfilled
Visionary leadership	Leadership based on a vision that inspires and mobilizes people within the integrated service model
Linking cultures	Linking cultures (e.g. values and norms) with different ideological values within the integrated service model

[a] Features were added at final taxonomy during the review and synthesis process

[b] Features were merged due to identical or nearly identical content

DISCUSSION

Principal findings

This study established an international consensus-based taxonomy to understand the integrated service models that arise in a primary care setting. The national and international Delphi studies resulted in the refinement of our previous taxonomy. The final taxonomy consists of twenty-one key features of an integrated primary care service model which are distributed over eight integration domains and organised into three main categories: scope (person-focused vs. population-based), type (clinical, professional, organisational and system) and enablers (functional vs. normative). The refinement of the taxonomy is a crucial step towards establishing an instrument that can measure a broad range of integrated service models.

The taxonomy contributes to a deeper understanding of the compound art of integrated care and provides direction for further field testing to identify effective components of integrated service delivery models in a primary care setting. The three main categories of the taxonomy provide a crucial differentiation to clarify and interpret practical examples of integrated care. To begin with, specifying the scope of an integrated care approach as either person-oriented or population-oriented helps to understand and describe the guiding principles and objectives of an integrated care approach. Although person-focused and population-based care could be viewed as opposite approaches, the strength of primary care philosophy is grounded in their symbiosis [2, 11]. Integrated primary care is the crucial point of tangency between public health services, which are more orientated on the population, and medical-oriented services, which are more focused on the individual [1-3]. Consequently, there is a need to specify the balance between person-oriented and population-oriented objectives of an integrated primary care service model. In contrast to more disease specific integrated care models (which are generally more person-focused), the current taxonomy acknowledges that both scopes are needed to improve the provision of continuous, comprehensive and coordinated services in an ambulatory care setting [12].

Second, the original RMIC indicates four equally important types of integration processes: clinical, professional, organisational and system integration. However, the results of the Delphi studies indicated that the clinical, professional and organisational integration processes were the most recognised among the experts. This finding corresponds to the fact that these processes have been the prime focus of scientific research and practice [4, 13-15]. The present study also indicates that less emphasis was placed on system integration processes. This result is in contrast with observations in the literature that societal and political influences are essential preconditions for achieving integrated primary care [3, 16, 17]. Research indicates that the development of integrated primary care is more hampered by political influences than technical influences [1]. Furthermore, the Chronic Care Model of Wagner [18] also stresses the importance of embedding integration efforts into the broader societal and political environment. Most of the experts in our study considered organisational integration processes as a systemic whole and found it difficult to differentiate between the system integration types of processes. One possible explanation might

be found in the composition of our expert panels, as we did not explicitly include experts with a macro policy background. However, health care practitioners, funders and policymakers have generally a more limited scope compared to the theoretical discourses of integrated care and primary care [19]. The broad inter-sectorial system definitions of both primary care and integrated care have failed to produce practical relevance for practices and policies [6]. Moreover, actors in a public health sector generally have a broader perspective on the social-political aspects of health compared to actors with a healthcare background [20-22]. We believe that more focus should be placed on the system environment when developing and evaluating integrated primary care service models. However, there is still a need to further clarify the domain of system integration and to explore how the different types of integration processes interact. For example, future research might investigate how local regulatory frameworks regarding integrated care influence the organisational and professional integration processes and vice versa.

Finally, the taxonomy assists to clarify and interpret the technical (functional) and cultural (normative) enablers in order to achieve common goals and optimal results. These functional and normative integration conditions seem to be of crucial importance to whether or not clinical, professional, organisational or system integration processes are successfully developed and sustained. Since integrated care spans across many different professional and organisational boundaries and mind-sets, it is crucial to clarify the required functional and normative prerequisites (e.g. data management, feedback, leadership) when developing and evaluating practical examples of integrated primary care.

Strengths and weaknesses

The strength of this study is the international Delphi study approach to establish a consensus-based taxonomy. The final taxonomy is theoretically grounded on the RMIC [3], has a solid base in available literature [6] and was tested against a wide mix of expert opinions. Nevertheless, the Delphi consensus approach does not necessarily provide the "right" answer to a given problem, but should be viewed as a means to structure group communication and determine the degree of consensus between expert groups [23]. The Delphi approach in this study added substantially to the ongoing debate of defining integrated care.

A potential limitation of this study relates to the selection of experts. We attempted to be inclusive; however, not all experts who were invited were able to participate. Twenty-eight experts refused to participate in Delphi study 2, mainly because the face-to-face meetings were bound to a fixed date and time. We do not expect these rejections to have biased the results substantially because the final panel consisted of a balanced number of experts with both practice and scientific backgrounds. Moreover, the final taxonomy was based on the results from three Delphi studies. Nonetheless, the composition of the expert panels remained biased. The present taxonomy is based on professional (i.e. practical and scientific) values and preferences, while the views of other stakeholder groups (like patients, policymakers or health insurers) are also considered important in integrated care. Different stakeholder groups are likely to have different preferences [24]. This limitation can be solved when the taxonomy is tested in

a local setting. All involved stakeholder groups (like patients, professionals, managers, insurers and policymakers) could be asked to comment on the relevance of the features included in the taxonomy and the relative importance per stakeholder could then be adapted accordingly [25-27].

Ultimately, the present taxonomy represents a first step towards a common language for evaluating integrated primary care services. The variety of perspectives of the numerous actors involved in integrated care made us aware of the difficulties of developing a clear, consensus-based, non-overlapping assessment tool and a scoring scale useful for scientific research, policy and practice. Since the taxonomy is grounded on the theoretical concept of integrated primary care, the appropriateness of the taxonomy in other healthcare settings (e.g. hospital settings) should be further explored. Further research should also focus on the development of such a tool with contextualised and non-overlapping items and scoring scales. Finally, the critical challenge is to demonstrate the impact of integrated primary care models in terms of the 'Triple Aim' goals: 1) improve the individual experience of health care, 2) improve the health of populations, and 3) reduce the per capita costs of care [1]. Therefore, there is a need to further link the performance shaping features of the taxonomy with the three linked outcome measures of the Triple aim to determine the impact and to guide the continues design and redesign of integrated primary care practice.

Implications for practice and research

The taxonomy is a valuable framework for patient organisations, professionals, managers, commissioners, and policymakers involved in the development of practical examples of integrated primary care. Profiling integrated primary care service models along this taxonomy makes it possible to obtain comprehensive and systematic information, and builds a common knowledge base regarding integrated primary care. Using the taxonomy to compare data across integrated care settings can promote the learning and sharing of (best) practices. Two activities involved in the development of an assessment tool are now pending: firstly, measurement instruments based on the taxonomy to generate reliable and validated quantitative scores; secondly, an agreed upon procedure that measures and incorporates the different perspectives of all the actors involved in integrated care (e.g. patients, professionals, managers, insurers and policymakers). Once these measurement instruments and procedures are developed, we may be able to understand which interaction patterns achieve better health at a lower cost within a specific context. We plan further work to develop this assessment tool, and invite anyone interested in helping to validate the taxonomy to contact the authors.

CONCLUSION

This study established a consensus-based taxonomy for understanding integrated primary care. Based on the theoretical foundations of the RMIC, the final taxonomy now specifies the scope, type and enablers of an integrated primary care service model. This knowledge base provides a crucial differentiation to clarify and support research, policy formulation and implementation

regarding the organisation of integrated primary care. For this purpose, the taxonomy has set a developmental agenda for both integrated primary care practice and research.

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PART II

PRACTICE: THE COLLABORATION PROCESSES IN INTEGRATED PRIMARY CARE

CHAPTER 5

EXPLORING THE SUCCESS OF AN INTEGRATED PRIMARY CARE PARTNERSHIP: A LONGITUDINAL STUDY OF COLLABORATION PROCESSES

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ABSTRACT

Background

Forming partnerships is a prominent strategy used to promote integrated service delivery across health and social service systems. Evidence about the collaboration process upon which partnerships evolve has rarely been addressed in an integrated-care setting. This study explores the longitudinal relationship of the collaboration process and the influence on the final perceived success of a partnership in such a setting. The collaboration process through which partnerships evolve is based on a conceptual framework which identifies five themes: shared ambition, interests and mutual gains, relationship dynamics, organisational dynamics and process management.

Methods

Fifty-nine out of 69 partnerships from a national programme in the Netherlands participated in this survey study. At baseline, 338 steering committee members responded, and they returned 320 questionnaires at follow-up. Multiple-regression-analyses were conducted to explore the relationship between the baseline as well as the change in the collaboration process and the final success of the partnerships.

Results

Mutual gains and process management were the most significant baseline predictors for the final success of the partnership. A positive change in the relationship dynamics had a significant effect on the final success of a partnership.

Conclusions

Insight into the collaboration process of integrated primary care partnerships offers a potentially powerful way of predicting their success. Our findings underscore the importance of monitoring the collaboration process during the development of the partnerships in order to achieve their full collaborative advantage.

BACKGROUND

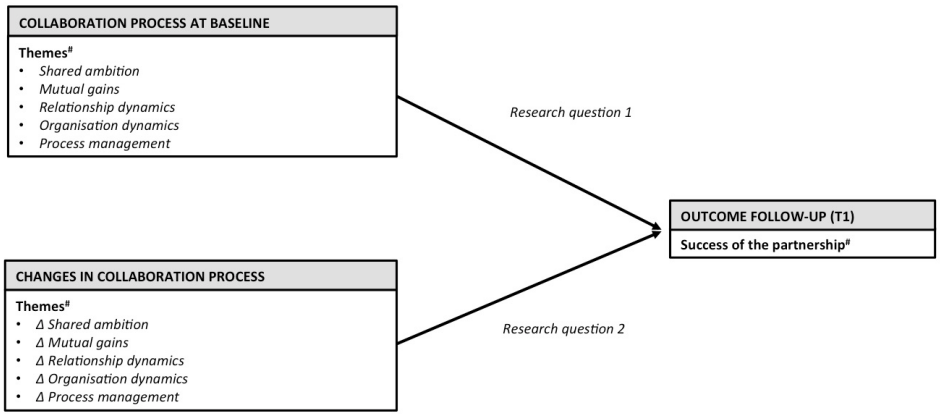
Integrated-care approaches are increasingly being promoted in order to respond to the challenges of the health care systems in high-income countries. Such challenges include reducing costs, improving quality of care and generating better patient outcomes [1-3]. Primary care, considered the cornerstone of these health systems, has proven to be essential for achieving desired health outcomes and limiting costs [3-5]. Primary care provides patients their first contact with professional health care, facilitates access to other health and social services and coordinates care for those with complex needs [5, 6]. In this study, we refer to integrated primary care as settings in which a network of multiple professionals and organisations across the health and social care system provide accessible, comprehensive and coordinated services to a population in a community. A key component of integrated service delivery is the collaboration between the different actors involved [7]. Such collaborative partnerships are widely used as a means to provide integrated health care services [8-11]. In this study, the term partnership refers to a setting that includes inter-sectorial collaboration as well as inter-organisational and inter-professional collaboration across a network of multiple organisations and professionals [8-11].

The collaboration processes through which partnerships evolve and are sustained have rarely been addressed empirically [12-16]. There is considerable uncertainty surrounding whether and under what conditions all actors (e.g. health care professionals, managers, and policymakers) involved in the partnership will collaborate [17]. This knowledge is important, as collaborative partnerships are often described as time-consuming, resource intensive, and fraught with challenges [18-20]. Especially in the health and social care systems, partnerships tend to have a high and often early failure rate[18]. There is also ample empirical evidence showing how the collaboration process influences the success of a partnership over time [21].

Bell, Kaats and Opheij (2013) [22] provided a conceptual framework that consists of five different themes in order to evaluate the collaboration processes of a partnership: 1. Shared ambition (shared commitment of the involved partners), 2. Mutual gains (understanding the various interests of the involved partners), 3. Relationship dynamics (relational capital among the partners), 4. Organisation dynamics (governance arrangements among the partners), and 5. Process management (process steering among the partners). The framework is grounded on a solid base of literature in which the individual themes have been described by various authors. For example, developing a clearly stated shared ambition (e.g. vision and mission) has been emphasized in the literature as an essential aspect of a successful partnership [16, 23, 24]. Closely related to the shared ambition theme is the mutual gains approach, which refers to the dialogue about the underlying interests of the partners to provide an ideal win-win solution. Numerous scholars [22, 25-27] have argued that the mutual gains approach is an essential aspect of developing a sustainable partnership. Another important aspect in the current literature is the relational capital among partners, defined as relational dynamics [16, 28-30]. Various researchers [29, 31, 32] have argued that close interpersonal ties between the partners can act as an effective mechanism to build mutual trust and respect within a partnership. Alliance literature also suggests that formal

governance mechanisms, defined as organisational dynamics, are also essential to developing trust and commitment within a partnership [16, 33-36]. Finally, a large body of literature has focused on the importance of process management in order to facilitate the complex and delicate nature of forging a collaborative partnership [19, 22, 37].

Although extensive literature has suggested the importance of the five themes of Bell et al. [22], empirical evidence on the impact of these themes on the success of a partnership over time is limited. By developing an understanding of how the collaboration process can successfully be managed, partners can better know in advance whether the partnership will achieve the desired "collaborative advantage" [38]. The aim of this paper is to explore the relationship between the collaboration process and the perceived success of a partnership. This paper aims to contribute to an understanding of how partnerships can successfully be established and maintained. Given the non-linear, continual change in development of a partnership [22, 39], it seems reasonable to evaluate the collaboration process themes at the start and during the partnership, in order to understand how these themes shape its final success. Therefore, we hypothesised that the perceived degree of success of a partnership is influenced by the presence at baseline of the collaboration process themes and their transformation over time. Specifically, this leads to the following research questions: 1) To what extent do the five collaboration process themes at baseline influence the final success of a partnership? 2) To what extent do changes in the collaboration process themes influence the final success of a partnership? The different themes and their assumed relationships to the perceived success of a partnership are illustrated in our analytical framework (see Figure 1).



Description and operationalization of the collaboration process themes and success of the partnership are described in the "Methods" section.

Figure 1: Hypothesised relations between the collaboration process and the success of the partnership

METHODS

Study design and setting

The present study was a longitudinal study conducted among partnerships enrolled in the national integrated primary care programme Op één lijn in The Netherlands (translated as "Primary Focus") [40]. As an initiative from the Ministry of Health, the programme aimed to stimulate integration through partnerships among local health and social services. Existing and new partnerships were invited to submit a grant application for the development and strengthening of their integrated primary care approach. The following criteria were used by the Netherlands Organization for Health Research and Development (ZonMw) to select and fund 69 eligible partnerships: 1) The subject of the partnership is centred on organisational (re) development aiming towards local multidisciplinary collaboration. The partnership needs to be focused on organisational advancement and processes, not on the organisation of patient care itself; 2) The organisational development aims to provide better quality, accessibility, service, efficiency and/or transparency of care; 3) The partnership focuses on local health and/or social service delivery (in a neighbourhood, village or region); 4) The project team of the partnership is multidisciplinary; 5) The partnership aims to create a sustainable organisational structure after the programme has been completed; 6) Patients or patients' representatives are involved in the partnership; 7) The partnership provides new knowledge about organisational structures and developments in local health care.

Grant applications were assessed for their relevance and quality using the standardised assessment procedure of the ZonMw [41].

As part of the programme, the selected partnerships participated in a longitudinal study from 2010 to 2013. For our evaluation, we used data that was collected at the start (T0) and the end (T1) of the funding period of each partnership. The average funding period of the partnerships was 22.9 months (SD: 7.5, range 5-36) and the average time between the program measurement points was 19.5 months (SD: 7.3, range: 6-38). Fifty-eight out of the 69 partnerships (84%) already existed before the start of the program and were operational (e.g. implementing shared agreements) at T0 of the program. To be included in the analyses, partnerships had to meet the following criteria: 1) form an inter/intra-sectorial, inter/intra-organisational and/or inter/intra-professional collaboration among different professionals and/or organisations, 2) provide data on T0 and T1 of the programme measurement points. Based on these two criteria, 59 partnerships out of 69 were considered to be eligible for this study. Ethical approval was not required under Dutch law, as no patients were involved in this study.

Data collection procedure

The collaboration process and perceived final success was examined at the strategic level of the partnership. A questionnaire was sent by e-mail at T0 and T1 to all active steering committee members of the partnerships as identified in the original grant application. The mailing list was verified by the coordinator of each partnership. An active steering committee member was

defined as any partner who was involved in the administration and strategic decision making processes in order to realise the collaborative objective of the partnership. In order to maximize the response rate, the partnership coordinator was asked to inform the steering committee members about the purpose of the study and the questionnaire. Furthermore, forced answering (e.g. which required respondents to enter a response before they are allowed to proceed to the next survey question) was used to prevent missing answers. An e-mail reminder was sent after one week to non-respondents. Additional data about the characteristics of the partnership were collected by a semi-structured interview with the partnership coordinator at T0 of the programme. For details about these semi-structured interviews, see "Additional file 1."

Measurements

A questionnaire was developed to measure the five collaboration themes, the perceived degree of success of the partnership and to collect descriptive information about the partnerships. The primary outcome measurement was the degree of success of the partnership as perceived by the steering committee members of each of the partnerships. Steering committee members were asked to rate the overall success of their partnership at the end of the evaluation programme on a scale from zero (very bad) to ten (excellent). The five collaboration themes were assessed at T0 and T1. Respondents were asked to indicate the extent to which he/she (dis)agreed with a given statement on a 4-point Likert-scale ranging from 1 (not at all) to 4 (totally). Details of the individual items of shared ambition, mutual gains, relationship dynamics, organisational dynamics and process management are provided in Table 2. In addition, the validity of the questionnaire was assessed during the current study.

Data analyses

Individual responses were aggregated to the partnership level, as the partnership level was the primary unit of analyses. Respondents with more than 30% of missing answers on the collaboration theme items were excluded, as they had stopped their responses on the questionnaire prematurely. Then, the within-partnership variance was examined in relation to the between-partnership variance by using a one-way analysis of variance (ANOVA). The ANOVA test was conducted to determine if it was justifiable to aggregate the individual responses to the partnership level [18, 42]. Partnership-level scores were obtained by calculating the scale score for each respondent and then taking the average score of all the respondents within a partnership [18]. Next, the validity and reliability of the collaboration theme subscales at baseline were tested at the partnership level. To test the construct validity, we performed an exploratory principal-component factor analyses with varimax rotation on all of the five subscales [18]. A factor loadings threshold of >.40 was applied to identify items that cluster together [43]. In addition, a Cronbach alpha of >.70 was used as threshold for the reliability of each subscale [43]. Changes in collaboration process were calculated as follows: (scores on T1 – scores on T0)/ scores on T0.

Bivariate relationships between the variables were estimated using Pearson correlation coefficients (r).

Multiple regression analyses using forced entry were conducted to answer both research questions. Separate analyses were conducted as the sample size limited the number of independent variables that could be included in the model. The variance inflation factor (VIF) was assessed with a threshold of ≤ 10 for acceptable collinearity [43]. To answer the first research question, the association between the collaboration process at baseline and perceived success was examined. A separate regression analysis was conducted to examine the second research question regarding the change in collaboration process. The significant baseline and change variables of the previous analyses were used in a final regression analysis.

Because of the exploratory nature of this study, p-values between .05 and .10 were considered suggestive for an association, and correlations with a p-value less than .05 were considered as statistically significant [18]. Data analyses were performed using SPSS version 21 for Windows (IBM Statistics).

RESULTS

Sample characteristics

Fifty-nine out of the 69 enrolled partnerships (86%) met the criteria for inclusion. Table 1 shows the general characteristics of the 59 partnerships at baseline. The overall individual response across these partnerships was 75% (338 out of 450 questionnaires) at T0, and 75% (320 out of 426 questionnaires) at T1. Seventeen respondents at T0 and 16 respondents at T1 missed > 30% of the collaboration theme items and were excluded, resulting in 321 respondents at T0 and 304 at T1.

Table 1: General characteristics of the 59 partnerships

Funding configuration	
Funding period (months), mean (SD), range	22.9 (7.5), 5-36
Funding (€), mean (SD), range	97.634 (45.846), 32.930-294.100
Scope and objective	
Geographic scope, n (%)	
Local community level	46 (78.0)
Regional province level	13 (22.0)
Objective, n (%)	
Chronic care	11 (18.6)
Elderly	10 (16.9)
Local collaboration	17 (28.8)
Integrating health and social care	14 (23.7)
Other	7 (11.9)
Organisational configuration	
Prior history of collaboration	
Yes	50 (84.7)
No	9 (15.3)
Own investment, n (%)	
Yes	14 (23.7)

No	45 (76.3)
Legally formalised, n (%)	
Yes	7 (11.9)
No	52 (88.1)

Preliminary analyses

The within-partnership variance was significantly less ($p \leq .01$) in relation to the between-partnership variance for the collaboration process variables and the success of the partnership. These findings suggest that the mean of the individual responses for each scale within a partnership is a good approximation of the partnership as a whole [18, 42].

Exploratory principal components factor analyses with varimax rotation showed that the shared ambition, mutual gains and organisational dynamics resulted in a one-factor solution (see Table 2 notes). Initially, the relationship dynamics and process management scale resulted in a two-factor solution, and in both scales, one item did not demonstrate salient factor loading (i.e. > .40). These items (item e for relationship dynamics and item b for process management) were removed from the two scales, resulting in a satisfactory one-factor solution for both cases. In addition, the reliabilities of the scales were more than adequate, with Cronbach's alphas ranging from .86 for the organisational dynamic scale and .73 for the relationship dynamic scale. The results of the factor and internal reliability analyses as well as the descriptive statistics for all scales at T0 and T1 can be found in Table 2.

Table 2: Characteristics of the variables at baseline (T0) and follow-up (T1)

				Baseline (T0)		Follow-up (T1)		Δ (T1-T0/T0)	
Variable	Items	Range	Cronbach's Alpha	Mean	SD	Mean	SD	Mean	SD
Outcome									
Perceived success of thepartnership	1	0-10	NA	NA	NA	7.34	0.80	NA	NA
Collaboration process themes									
Shared ambition*	4	1-4	0.78	3.49	0.27	3.49	0.27	0.01	0.10
Mutual gains**	4	1-4	0.82	3.04	0.34	3.02	0.39	0.00	0.12
Relationship dynamics***	4	1-4	0.73	3.20	0.26	3.27	0.36	0.03	0.11
Organisation dynamics****	6	1-4	0.86	3.02	0.28	3.08	0.37	0.02	0.14
Process management*****	4	1-4	0.80	3.04	0.29	3.11	0.36	0.03	0.13

NA (not assessed)

* Items: a) Is the ambition shared among the partners. b) is the ambition attractive for the partners. c) is the ambition aligned with the collaboration strategy of each partner. and d) does the ambition have a personal significance for the key players in the partnership? Single-factor solution with factor loadings ranging from: 0.671 to 0.887.

** Items: a) Do the partners have sincere interest in one another's interests. b) do the partners have a dialogue about one another's interests. c) are the partners willing to negotiate with one another. and d) does the partnership create value for each of the partners? Single-factor solution with factor loadings ranging from: 0.694 to 0.877.

*** Items: a) Do the partners have the personal ability to connect. b) does the group processes consolidate the partnership. c) do the partners trust one another. d) is leadership being demonstrated. and e) is leadership being granted? Two-factor solution indicated that item e) did not demonstrate salient factor loading (i.e. > .40). After excluding item e) a single-factor solution with factor loadings ranging from 0.647 to 0.811.

**** Items: a) Is the structure of the partnership aligned with the partners' objective(s). b) is the direction of the partnership aligned with the partners' objective(s). c) can the partnership count on the support of the management/ professionals and stakeholders. d) are the agreements of the partnership clear. e) are the agreements being fulfilled by the partners. and f) does the partnership realize the proposed objective(s)? Single-factor solution with factor loadings ranging from: 0.669 to 0.841.

***** Items: a) Is there a thorough phasing for the planning of the partnership. b) is the shared ambition of the partnership being realised. c) is the attention of the partners balanced between the content and process of the partnership. d) are the roles clearly divided within the partnership. and e) is the collaboration process clearly directed? Two-factor solution indicated that item b) did not demonstrate salient factor loading (i.e. > .30). After excluding item b). a single-factor solution with factor loadings ranging from 0.683 to 0.846.

Correlations

Moderate to strong correlations were found between the collaboration process variables at T0 which were all statistically significant ($p < .01$) (Table 3, rows 1-5). In addition, correlations between the change in collaboration process variables ranged from moderate to strong and were all statistically significant ($p < .01$, rows 6-10). Finally, statistically significant relations ($p < .01$) were found for the variables of mutual gains, relationship dynamics, organisational dynamics and process management at T0 and T1 with the perceived success of the partnership (Table 3, row 11).

Table 3: Pearson correlations for the study variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. Shared ambition	-										
2. Mutual gains	0.68**	-									
3. Relationship dynamics	0.71**	0.69**	-								
4. Organisation dynamics	0.67**	0.67**	0.80**	-							
5. Process management	0.54**	0.55**	0.70**	0.84**	-						
6. Δ Shared ambition	-0.63**	-0.23	-0.37**	-0.32*	-0.26*	-					
7. Δ Mutual gains	-0.39**	-0.37**	-0.30*	-0.26*	-0.07	0.63**	-				
8. Δ Relationship dynamics	-0.30*	-0.15	-0.36**	-0.22	-0.08	0.61**	0.75**	-			
9. Δ Organisation dynamics	-0.35**	-0.12	-0.32*	-0.42**	-0.26	0.71**	0.75**	0.78**	-		
10. Δ Process management	-0.25	-0.00	-0.28*	-0.31*	-0.39**	0.62**	0.50**	0.58**	0.78**	-	
11. Perceived success of the partnership	0.27*	0.42**	0.33**	0.40**	0.46**	0.32*	0.54**	0.62**	0.55**	0.36**	-

*p < .05. **p <.01.

Δ change in collaboration process = (T1 score – T0 score)/ T0 score

Baseline collaboration process

The regression analysis showed the results obtained in response to the two main research questions (Table 4). In order to answer the first research question, Model 1 examined the baseline collaboration process variables that were associated with the perceived success of the partnership at T1. The baseline collaboration process explained 27% of the variance in partnership success. Only mutual gains (β = .36, p <.10) and process management (β = .44, p <.10) were predictors for the final success of the partnership. None of the other baseline collaboration process variables had a predictive value for the perceived success.

Change in collaboration process

To answer the second research question, Model 2, as shown in Table 4, was examined for association between the change variables of the collaboration process and the final perceived success of the partnership. Together the change variables of the collaboration process explained 43% of the variance in success, and change in relationship dynamics was found to be the greatest predictor of success (β = .45, p <.05). None of the other change variables of the collaboration process had a predictive value for the final perceived success.

Combined model

Model 3 of Table 4 identified the association between the significant baseline and changed variables of Models 1 and 2 along with the perceived success of the partnership. Together, these variables explained 72% of the variance in partnership success. Mutual gains (β = .35, p <.001) and process management (β = .32, p <.001) at baseline and the change in relationship dynamics over time (β = .70, p <.001) were predictors for the final success of the partnership.

Table 4: Regression analysis predicting the perceived success of a partnership by baseline and change in collaboration process (N = 59)

Variable	Standardised Beta Coefficient (β)	p-value
Model 1: Collaboration process at baseline		
Shared ambition	-0.10	0.59
Mutual gains	0.36	0.05*
Relationship dynamics	-0.08	0.72
Organisation dynamics	-0.08	0.76
Process management	0.44	0.05*
Model 2: Change in collaboration process		
Δ Shared ambition	-0.22	0.16
Δ Mutual gains	0.16	0.39
Δ Relationship dynamics	0.45	0.02*
Δ Organisation dynamics	0.30	0.23
Δ Process management	-0.77	0.66

Model 3: Combined		
Mutual gains	0.35	0.00***
Process management	0.32	0.00***
Δ Relationship dynamics	0.70	0.00***

Δ change in collaboration process = (T1 score - T0 score)/ T0 score

Model 1: R^2= .27**. Model 2: R^2 = .43*** and Model 3: R2 = .72***

*p ≤ .05. **p <.01. ***p <.001

DISCUSSION

The aim of this study was to gain a better understanding of the collaboration processes and their relation to the perceived success of a partnership. Partnerships that were more positive about mutual gains and process management at baseline had a significant higher level of perceived success (research question 1). Additionally, partnerships that demonstrated an increase in relationship during the collaboration process also had higher levels of perceived success (research question 2).

Contribution of research findings

To the best of our knowledge, this research is among the first empirical studies to explore how changes in the collaboration process influence the final success of a partnership in an integrated primary care setting. An intriguing finding was that the mutual gains approach at baseline, e.g. being explicit and voicing the interests of the partners, was one of the preconditions related to the success of a partnership. Although the mutual gains approach is considered as an ongoing aspect of the successful functioning of a partnership [22, 25-27], mutual gains did not change in the partnerships during our study. Process steering at the start of a partnership, defined as process management, played another crucial role in explaining the final success of a partnership. When comparing the collaboration process themes at the start with the change of collaboration process over time, only relationship dynamics appeared to have a significant effect on the final success of the partnership. This result highlights the importance of building relational capital during the developmental phase of a partnership and is consistent with previous research [16, 28, 29].

We found no association between higher scores of shared ambition (e.g. vision and mission of the partnership) and the perceived success of a partnership, even though a clear vision and mission is widely regarded as an essential condition for a successful partnership [16, 23]. This might be explained by the evolution of the partnerships included in this study. One explanation could be that the partnerships had already developed and sustained a shared ambition at the start of the study, partly as a result of applying for the grant from the funding agency. Likewise, the majority of the partnerships were already formed before the start of the program.

Furthermore, our findings show that organisation dynamics did not appear to have any importance on the final success of a partnership. We found this result surprising given the focus

of the "Primary Focus" programme on the organisational arrangements within the partnerships (see method section). The need for effective organisational arrangements is suggested in various academic fields (e.g. economics, business administration, management, and public health sciences) [16, 33-36]. Existing literature also suggests that both trust-based (relationship dynamics) and control-based (organisational dynamics) governance mechanisms play a crucial role in partnership development [34, 35]. Given the fact that an increase in relationship dynamics during the programme had a significant effect on the perceived success, this may indicate that trust-based governance mechanisms are of more importance in the development of integrated primary care projects.

Implications for practice and research

Our findings can help to improve the formation and development of a partnership, as many partnerships struggle to realise their collaborative advantage [16, 18-20, 38]. The strength of this study is the longitudinal design, which allowed studying a more causal relationship between collaboration process and the perceived success of a partnership. This knowledge is a vital step to understanding and improving the collaborative advantage of integrated care approaches. Another positive point of this study was the relatively high response rates (75%) at both time points. The forced answering method and the cooperation with the project coordinators during the data collection process likely contributed to the high response rates.

The study has also some limitations. Although the included partnerships in this study varied in their duration, scope, objectives and size, they constituted a convenience sample. Due to the potential bias of the selected participants, caution should be taken when generalizing the results of this study. For example, positive results are likely to be overrepresented. Through the selection process of the funding agency, more successful partnerships could have been selected. In particular, the dependency of the partnerships on funding could have resulted in more positive reporting by the steering group members in order to be perceived more favourably for future funding. Moreover, the use of self-reported data always involves risks of social desirability and differences in recall [44]. Furthermore, this study represents the managerial perspective of the steering group members within a partnership. Therefore, the results cannot be generalized without reservations to reflect the perspectives of all the actors (e.g. clients, professionals or policymakers) involved in an integrated primary care setting [2, 7]. In addition, to our knowledge, this is one of the few studies that used a survey to study the collaboration process, with little empirical precedent to develop most of the measures that were used. Although the construct validity was assessed at baseline, the reliability of the scales over time (i.e. test-retest reliability) was not assessed. Therefore, there is scope to improve and refine some of the measures used in this study.

Future research should focus on the development of outcome measures that represent the different perspectives of all actors (e.g. policymakers, managers, health care professionals and patients), and can be used as a proxy for partnership performance. Furthermore, it would be useful to develop additional measures using objective data (e.g. meeting hours along with

methods and frequency of contacts among partners) and to examine how they relate to corresponding self-report measures. Future research should also examine how the theoretical relationships considered in this study are related to the actual impact of a partnership on health and cost-related outcomes [3].

CONCLUSION

The findings of this study allow us to better understand the underlying collaboration process and offer a potentially powerful method to predict the success of an integrated primary care partnership. Our results indicate that managing a successful partnership within an integrated primary care context explicitly requires partners' interests and process management at the start, and, subsequently, the building of relational capital throughout the collaboration process. While our findings do not guarantee the success of a partnership, our results do underscore the importance of monitoring the collaboration process which underlies the development of partnerships in order to achieve their full collaborative advantage.

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ADDITIONAL FILE 1: SEMI-STRUCTURED INTERVIEW GUIDE

The following elements were addressed during the interview with the project coordinator at T0.

General objectives of the partnership

- What are the general objectives of the partnership?
- What are the intended outcomes of the partnership?
- What is the geographical scope of the partnership (e.g. local. regional or national)?

The organisational (financial and legislative) structure of the partnership

- Is the partnership legally formalised (e.g. foundation. association. private company)?
- Do the participating organisations invest in the partnership?
- How do the participating organisations invest in the partnership?

Process management activities

- Did the participating organisations worked together before?
- Could you describe the prior collaboration activities?

CHAPTER 6

COLLABORATION PROCESSES AND PERCEIVED EFFECTIVENESS OF INTEGRATED CARE PROJECTS IN PRIMARY CARE: A LONGITUDINAL MIXED-METHODS STUDY

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ABSTRACT

Background

Collaborative partnerships are considered an essential strategy for integrating local disjointed health and social services. Currently, little evidence is available on how integrated care arrangements between professionals and organisations are achieved through the evolution of collaboration processes over time. The first aim was to develop a typology of integrated care projects (ICPs) based on the final degree of integration as perceived by multiple stakeholders. The second aim was to study how types of integration differ in changes of collaboration processes over time and final perceived effectiveness.

Methods

A longitudinal mixed-methods study design based on two data sources (surveys and interviews) was used to identify the perceived degree of integration and patterns in collaboration among 42 ICPs in primary care in The Netherlands. We used cluster analysis to identify distinct subgroups of ICPs based on the final perceived degree of integration from a professional, organisational and system perspective. With the use of ANOVAs, the subgroups were contrasted based on: 1) changes in collaboration processes over time (shared ambition, interests and mutual gains, relationship dynamics, organisational dynamics and process management) and 2) final perceived effectiveness (i.e. rated success) at the professional, organisational and system levels.

Results

The ICPs were classified into three subgroups with: 'United Integration Perspectives (UIP)', 'Disunited Integration Perspectives (DIP)' and 'Professional-oriented Integration Perspectives (PIP)'. ICPs within the UIP subgroup made the strongest increase in trust-based (mutual gains and relationship dynamics) as well as control-based (organisational dynamics and process management) collaboration processes and had the highest overall effectiveness rates. On the other hand, ICPs with the DIP subgroup decreased on collaboration processes and had the lowest overall effectiveness rates. ICPs within the PIP subgroup increased in control-based collaboration processes (organisational dynamics and process management) and had the highest effectiveness rates at the professional level.

Conclusions

The differences across the three subgroups in terms of the development of collaboration processes and the final perceived effectiveness provide evidence that united stakeholders' perspectives are achieved through a constructive collaboration process over time. Disunited perspectives at the professional, organisation and system levels can be aligned by both trust-based and control-based collaboration processes.

BACKGROUND

Integration of health and social services is widely recognized as an essential strategy for enhancing the sustainability and affordability of any health care system [1-3]. A number of leading primary care models exist today as examples of integrated care approaches, such as the Patient-Centered Medical Homes (PCHM) and Accountable Care Organisations (ACOs) in the United States, Primary Care Trusts (PCT) in the English National Health Service (NHS), and Community Health Centres and Care Groups in The Netherlands [4-7]. Primary care is considered the cornerstone upon which various health and social services can be built [1, 8], and it has proven to be essential for achieving desired health outcomes and limiting costs [3, 9]. Throughout this paper, we refer to integrated primary care as ambulatory care settings in which multiple professionals and organisations across the health and social care system provide accessible, comprehensive and coordinated services to a population in a community [10]. Despite the increasing popularity of integrated care, there is a lack of knowledge on how integrated care can effectively be implemented in a primary care setting [8, 11, 12].

Early academic research on integrated care has mainly focused on centralised top-down implementation strategies (e.g. regulatory frameworks, contractual mechanisms), which failed to demonstrate improved outcomes and highlighted the difficulties of aligning various actors (e.g. policymakers, managers, organisations, professionals) across multiple settings [13-16]. More recently scholars argue that bottom-up collaborative approaches (e.g. partnerships and networks) might be more effective strategies to implement integrated care [11, 16-21].

The underlying assumption is that effective implementation strategies are linked to relational 'trust-based' (e.g. trust, mutual respect and shared values), rather than to functional 'control-based' (e.g. formal rules and structures) integration mechanisms [18, 22].Within a primary care context, trust-based collaboration approaches from the bottom-up are considered essential for stimulating the integration of different services [8, 10, 11] because they have traditionally been delivered by professionally-owned, disjointed, small-scale practices [23].

However, empirical evidence regarding the collaboration processes that underlie the development of integrated care in a primary care setting is scarce [10]. Within integrated care studies, the collaboration process towards integrated care is often evaluated as a "black box," with little understanding of the critical mechanisms for success or failure[11, 24]. This knowledge gap makes it difficult to understand and explain how the evolution of collaboration processes serves as a means to develop integrated care, thus restraining the opportunities to identify effective implementation strategies. This knowledge is of utmost importance, as implementing integrated care through collaborative partnerships is described as time-consuming, resource intensive, and fraught with challenges [19, 21, 25]. Consequently, there is a need to identify the underlying collaboration processes over time to better understand how integrated care can effectively be implemented among and between different professional and organisational groups.

In this study, we draw from the Rainbow Model of Integrated Care (RMIC) [8] to define

the concept of integrated care and use the model of Bell, Kaats and Opheij [26] to describe the collaboration processes over time. The RMIC defines integrated care from four different perspectives and levels: 1) clinical or service integration (patient or client perspective at the micro level), 2) professional integration (professional perspective at the meso level), 3) organisational integration (managerial perspective at the meso level), and 4) system integration (policymaker perspective and policy climate at the macro level). The four key domains provide a framework to characterise the degree of integration from a multifocal perspective. Within the present study, the RMIC is used to explore possible differences among integration perspectives between the stakeholders' at the clinical, professional, organisational and system levels. The literature suggests that a similarity of integration perspectives by multiple stakeholders is needed in order for an integrated care initiative to be effectively implemented [16, 27]. Similarly, analysing the underlying changes in collaboration processes helps to understand the way in which (dis) similarities of integration perspectives between stakeholders are achieved [10, 11].

The conceptual model of Bell et al. [26] explicates five dimensions for evaluating a collaboration process: 1) Shared ambition (shared commitment), 2) Mutual gains (acknowledgement of the various interests), 3) Relationship dynamics (relational capital), 4) Organisation dynamics (shared control), and 5) Process management (process steering). The model is developed within the field of inter-organisational management science and is grounded on a solid base of literature in which the different dimensions have been described [28-32]. In a previous study, we found that these five collaboration process dimensions were a powerful way to predict the final perceived effectiveness (i.e. rated success) of integrated care projects (ICPs) in The Netherlands [10].

The first aim of this study was to develop an exploratory typology of ICPs based on the perceived degree of integration of stakeholders at the professional, organisational and system levels. The second aim was to study how the types of integration differ in changes of collaboration processes over time and final perceived effectiveness. The following research questions were addressed: 1) Which subgroups of ICPs can be distinguished based on the final perceived degree of integration from a professional, organisational and system perspective?; 2) To what extent do these subgroups of integration differ with regard to changes in the five collaboration processes over time?; and 3) To what extent do these subgroups of integration differ with regard to the perceived effectiveness (i.e. rated success) of an ICP from the professional, managerial and policy perspective?

METHODS

Study design and setting

The present study was a longitudinal mixed-methods study conducted among ICPs enrolled in the Dutch national integrated primary care programme Op één lijn (translated as "Primary Focus") [33]. The Primary Focus programme aimed to stimulate integration through collaboration among community health and social services in a primary care setting by funding 69 ICPs across The Netherlands. Selected ICPs received a service grant in 2010 (n=50) or in 2011 (n=19) by the

Netherlands Organization for Health Research and Development (ZonMw). A full description of the selection criteria can be found in a previous publication [10]. As part of the programme, the ICPs participated in a longitudinal study (from 2010 to 2013) that aimed to assess the changes in collaboration processes as well as the integration arrangements that were foreseen to arise at the end of the programme. The average funding period of the participating 69 ICPs was 22.9 months (SD 7.5, range 5-36) and the average time between programme measurement point at the start (T0) and end (T1) was 19.5 months (SD 7.3, range: 6-38).

To be eligible for the present study, ICPs had to meet the following two criteria: 1) consist of a form of inter/intra-sectorial, inter/intra-organisational and/or inter/intra-professional collaboration among different professionals (such as general practitioners (GP), nurses and social workers) and/or organisations (such as GP practices, nursing homes, long-term care facilities, and hospitals) and 2) have data available regarding the degree of integration as perceived by professionals, the steering committee and the external evaluators (interviewers). Based on the selection criteria, 42 out of 69 ICPs were selected (61%).

Although initially planned it was not feasible to include the patient perspective, as due to various reasons (e.g. resistance among ICPs, questionnaire inappropriate for specific population) data was only available for 26 out of the 69 ICPs (38%). As a result, the patient perspective was excluded from further analysis in the present study.

Data collection procedure

Both surveys and interviews were used to examine the changes in collaboration processes, the final perceived degree of integration and the effectiveness of the ICPs. At the system level every project coordinator was included and two additional stakeholders per ICP (using purposive sampling), and at the organisational and professional levels all participants of an ICP were included. Table 1 provides a summary of the data collection procedure.

1. *System level*: The degree of system integration and the perceived effectiveness from a policy perspective was evaluated using semi-structured interviews held by process evaluators at the end (T1) of the funding period of each ICP. Eight process evaluators conducted semi-structured interviews with the project coordinator and two stakeholders per ICP. The stakeholders were selected based on their central position in the implementation process of an ICP as identified by the project coordinator. The interviews were transcribed and coded by the same process evaluator who conducted the interviews using a step-by-step thematic analysis procedure to enable an overall quantitative analysis. An interview scheme was used to obtain information about the fit between the strategic objectives and the policy conditions (e.g. public laws and regulations) and the final success of the ICP (see Additional file 1 for the interview scheme). Data was transcribed in a priori developed qualitative template using excel processing software (see Additional file 1 for an example of a qualitative template). Qualitative data was coded using the coding structure derived from the process evaluation interviews conducted at the start of the program. The interview data were merged per ICP by the process evaluator, who also provided written comments and interpretations of exemplar

quotes per participant and recurring themes across participants. A structured case report for each ICP was written consisting of a narrative summary of all information obtained. The participants were emailed a copy of the case report to review and verify for accuracy. Subsequently, the process evaluator rated the degree of system integration and the final success of the ICP on a standardised coding scheme using the content from the case reports.

2. *Organisational level*: The degree of organisational integration, the changes in collaboration processes, and the perceived effectiveness from a managerial point of view were examined using questionnaires completed by the steering committee members of each ICP. Steering committee members were defined as partners who were involved in the administration and strategic decision making processes of the ICP as identified in the original grant application, and verified by the project coordinator.

   To explore the changes in the collaboration process dimensions, a questionnaire was sent by e-mail at the start (T0) and end (T1) of the funding period of each ICP. The questionnaire at T0 contained questions about the collaboration process dimensions, and the modified questionnaire at T1 consisted also of questions regarding information about the final perceived degree of integration effectiveness of the ICP (Details of the questionnaire are provided in the next section "Measures."). An e-mail reminder was sent to non-respondents after one week.

3. *Professional level*: The degree of professional integration and the perceived effectiveness from a professional point of view was measured using questionnaires completed by frontline professionals at T1 of the funding period of each ICP. Questionnaires were sent by e-mail to all active frontline professionals of an ICP as identified by the project coordinator. A frontline professional was defined as any health or social professional (such as GP, nurse, social worker and allied health professionals) who took part in the frontline service delivery of the ICP. Reminders were sent to non-respondents after two weeks and again after four weeks.

Table 1: Overview data collection procedure

Levels	Participants	Measurement methods	Data processing	Variables (Time points)
System	Project coordinator and two stakeholders	Semi-structured interviews	Coding by use of code book*	System integration (T1) Perceived effectiveness (T1)
Organisational	Steering committee members	Questionnaire	Aggregated means at ICP level	Organisational integration (T1) Perceived effectiveness (T1) Collaboration process (T0 - T1)
Professional	Frontline professionals	Questionnaire	Aggregated means at ICP level	Professional integration (T1) Perceived effectiveness (T1)

* For details of the coding process see additional file 1.

Measures

1. *System level:* A standardised coding scheme was used to analyse the degree of system integration and the success of the ICP from a policy perspective. The external process

evaluators (interviewers) identified the degree of system integration from the interviews, which was defined as the perceived degree to which the implementation of an ICP was facilitated by public laws and regulations. Interviewers coded: (1) the extent to which public laws and regulations facilitated the implementation of the ICP on a 3-point scale ranging from one (not at all) to three (completely), and (2) the overall perceived effectiveness of the ICP on a scale ranging from one (unsuccessful) to five (very successful) based on the content of the template of each ICP. Details about the three steps and standardized documents used to quantitatively code the degree of system integration and the perceived effectiveness can be found in Additional file 1.

2. *Organisational level:* A questionnaire based on the model of Bell et al. [26] that was developed and validated by the authors in a previous study[10] was used to measure the five collaboration process dimensions at T0 and T1. For each collaboration dimension (shared ambition, mutual gains, relationship dynamics, organisational dynamics and process management), steering committee members indicated the extent to which he/she agreed with a given statement on a 4-point Likert-scale ranging from 1 (not at all) to 4 (totally). Details about the individual items of the collaboration process variables can be found in an additional publication [10]. Changes in collaboration processes were calculated as follows: (score on T1 minus score on T0)/ score on T0.

   The questionnaire sent at T1 was complemented with items to measure the perceived degree of organisational integration. Organisational integration was defined as "the extent to which the steering committee members experience a collectively elaborated inter-organisational strategy within the ICP." Organisational integration was assessed with a four item, 4-point Likert scale ranging from one (not at all) to four (totally). Details of the individual items of the organisational integration variable are provided in Table 1. The internal consistency and reliability of the organisation integration scale was tested during the current study. Finally, steering committee members were asked to rate the overall perceived effectiveness of the ICP on a scale from zero (unsuccessful) to ten (very successful).

3. *Professional level:* Professional integration was defined as "the extent to which frontline professionals experienced a shared agreement on interdisciplinary service delivery." Items for measuring professional integration were taken from existing surveys that address coordinated service delivery in a primary care setting [34, 35]. Response categories ranged on a 5-point Likert scale from one (very unsatisfied) to five (very satisfied). Details of the items used to measure professional integration are listed in Table 1. The internal consistency and reliability of the professional integration scale was analysed during the current study. Finally, professionals were asked to rate the overall perceived effectiveness of the ICP on a scale from one (unsuccessful) to five (very successful).

The aggregated means, minimum, maximum and standard deviations of above mentioned measures can be found in Table 2.

Table 2: Characteristics of the variables

Variable	No. of items	Range (lowest score-highest score)	Cronbach's Alpha	Baseline (T0)		Follow-up (T1)		Change (T1-T0/T0)	
				Mean	SD	Mean	SD	Mean	SD
Degree of integration									
System integration*	1	1-3	NA	NA	NA	2.70	0.39	NA	NA
Organisational integration **	4	1-4	0.82	NA	NA	3.31	0.33	NA	NA
Professional integration***	10	1-5	0.88	NA	NA	3.52	0.27	NA	NA
Change in collaboration process**									
Δ Shared ambition	4	1-4	0.78	3.50	0.25	3.48	0.26	0.00	0.09
Δ Mutual gains	4	1-5	0.82	3.06	0.34	3.01	0.40	-0.01	0.14
Δ Relationship dynamics	4	1-6	0.71	3.22	0.29	3.27	0.35	0.02	0.12
Δ Organisation dynamics	6	1-7	0.86	3.05	0.29	3.09	0.35	0.02	0.14
Δ Process management	4	1-8	0.82	3.05	0.29	3.12	0.35	0.03	0.13
Success of the project									
Perceived success at system level	1	1-5	NA	NA	NA	3,67	0,79	NA	NA
Perceived success at organisational level	1	0-10	NA	NA	NA	7.22	0.90	NA	NA
Perceived success at professional level	1	1-5	NA	NA	NA	4.05	0.36	NA	NA

NA (not assessed).

* An acceptable level of inter-rater reliability (κ =.60) was found for the system integration variable.

** Items: a) Is the aim of the inter-organisational arrangement explicated? b) Are the solution(s) of the inter-organisational arrangement explicated? c) Are the chances of the inter-organisational arrangement explicated? and d) Is the form for the inter-organisational arrangement explicated? Single-factor solution, with factor loadings ranging from: 0.798 to 0.832.

***Items: a) Leadership is being demonstrated. b) Are roles and tasks of the team clear? c) Are final clinical goals agreed upon? d) Do information systems (ICT) support the team's functionality? e) Are there agreements about the interdisciplinary care delivery? f) Are outcomes for the patients clear? g) Are outcomes for the professionals clear? h) Are outcomes for the community clear. i) Is the interdisciplinary approach applicable elsewhere. j) Is the effectiveness of the inter-professional team clear? Single-factor solution, with factor loadings ranging from: 0.348 to 0.784.

**** Details about the items of the collaboration process variables can be found in an additional publication [10].

Data Analyses

A randomly selected sample of five ICPs (12%) was additionally coded by an author (PV) to explore the inter-rater reliability for the system integration variable. A Cohen's κ of .60 was found between the codes from the author and the interviewers, indicating an acceptable level of inter-rater reliability [36]. For the organisational integration, professional integration and collaboration process scales (shared ambition, mutual gains, relationship dynamics, organisational dynamics and process management), a maximum of 30% missing answers per scale at the individual response level was tolerated [10]. Then, the validity and reliability of the organisational and professional integration variables was tested at the individual response level. To analyse the internal consistency, an exploratory principal-component factor analysis with varimax rotation was conducted, using a threshold of ≥ .30 to identify items that clustered together (see Table 1, Notes). Cronbach's alphas ranged from .71 for the relationship dynamic scale and .88 for the professional integration scale.

Subsequently, individual responses were aggregated to the project level as the ICP level was the primary unit of analysis. To determine whether data collected from the individual level could be aggregated to represent the views at the ICP level, the within-partnership variance was examined in relation to the between-partnership variance by using a one-way analysis of variance (ANOVA) [19, 37]. Project-level scores were obtained by calculating the scale score for each respondent and then taking the average score across all of the respondents within a project [19]. The within-partnership variance was significantly less ($p \leq .01$) in relation to the between-partnership variance for the professional integration, organisational integration, collaboration process and effectiveness variables. These findings indicate that the mean scores could be aggregated to the ICP level [19, 37].

A cluster analysis was conducted using the system, organisational and professional integration variables. Pearson correlation was assessed to check for multicollinearity between the variables (all correlations were <0.5) [38, 39]. As each variable was measured on a different scale, standardization was necessary prior to each variable entering into the cluster analyses [40]. A three-step procedure was followed for clustering the ICPs in different subgroups [40, 41]. First, the appropriate number of clusters was determined by means of hierarchical cluster analysis using Ward's method and the Euclidean Distance. An increase in the agglomeration coefficient indicated a large jump in within-cluster variability, providing strong support for a three-cluster solution. Second, a non-hierarchical analysis was performed (K-means method) to validate and adjust the results of the hierarchical procedures, using the initial cluster centroids from Ward's method as seed points [40, 42-44]. Third, the stability of the cluster assignment between the Ward's and the K-means method was assessed using Cohen's κ coefficient of agreement [36, 41]. Results indicated a perfect agreement ($\kappa = 1.00$, $p < .001$), suggesting both methods produced a similar cluster solution of the ICPs [41]. The cluster means for each of the three integration variables were used to provide a meaningful interpretation of the clusters [40].

To assess differences in the degree of integration, change in collaboration processes and perceived effectiveness among the three subgroups (clusters), multivariate and univariate

analyses of variance with Bonferroni-adjusted post-hoc comparisons were used. Given the exploratory nature of this study, p-values between .05 and .10 were considered suggestive for an association, whereas p-values < .05 were considered statistically significant. All data analyses were performed using the Statistical Package for the Social Sciences version 21 for Windows (IBM Statistics).

Ethics

The study design of the Primary Focus programme was reviewed by the Independent Review Board Nijmegen (IRBN) [45]. The committee concluded that further ethical approval was not needed according to the Dutch Medical Research in Human Subjects Act (WMO). There were no ethical objections raised against the study. All participants were asked permission verbally or in writing to participate in the study.

RESULTS

Sample characteristics

Table 3 shows the general characteristics of the included ICPs. Among the 42 ICPs, a total of 126 interviews were conducted at the system level. The overall individual response at the organisational level was 71% (235 out of 330 questionnaires) at T0, and 78% (229 out of 294 questionnaires) at T1. At the professional level, the overall individual response was 37% (468 out of 1,279 questionnaires) at T1.

Table 3: General characteristics of the 42 ICPs

Funding configurations	
Funding period by agency (months), mean (SD), range	22.31 (7.31), 5-36
Funding by agency (€), mean (SD), range	89.154 (36.622), 32.930-188.892
Scope and objectives	
Geographic scope, n (%)	
Local community level	33 (78.6)
Regional province level	9 (21.4)
Objective, n (%)	
Chronic care	10 (23.8)
Elderly	7 (16.7)
Local collaboration	12 (28.6)
Integrating health and social services	7 (16.7)
Other	6 (14.2)
Organisational configuration	
Prior history of collaboration, n (%)	
Yes	38 (90.5)
No	4 (9.5)
Own investment, n (%)	
Yes	8 (19.0)
No	34 (81.0)

Legally formalised, n (%)	
Yes	7 (16.7)
No	35 (83.3)

Profiling the perceived degree of integration (research question 1)

To answer the first research question, three distinctive subgroups of integration were identified across the ICPs. Table 4 presents the mean scores for the integration variables per subgroup. Results of the between-subgroup post-hoc comparisons identified statistically significant differences between the subgroups for the perceived degree of system integration ($F(2, 39) = 26.67$, $p < .001$), organisational integration ($F(2, 39) = 21.58$, $p < .001$) and professional integration ($F(2, 39) = 9.18$, $p < .01$). The three subgroups were named according to their average characteristics regarding the perceived degree of integration.

Subgroup 1: United Integration Perspectives (UIP)

ICPs in this group comprised 31.8% (n = 16) of the sample. They were characterized by system, organisational and professional integration scores above average (see Table 3), and thus labelled as "United Integration Perspectives (UIP)." ICPs in this subgroup exhibited significantly higher scores on the organisation integration perspective (M = 3.52, SD = 0.17) than ICPs in subgroup 2 and subgroup 3 (M = 2.87, SD = 0.22; M = 3.30, SD = 0.29 respectively).

Subgroup 2: Disunited Integration Perspectives (DIP)

ICPs in this subgroup comprised 21.4% (n = 9) of the sample and were characterized by average scores on system and professional integration combined with relatively low organisational integration scores (see Table 4). This subgroup was interpreted as "Disunited Integration Perspectives (DIP)." ICPs in subgroup 2 were characterized by significantly lower levels on the organisation integration perspective (M = 2.87, SD = 0.22) compared to subgroup 1 (M = 3.52, SD = 0.17) and subgroup 3 (M = 3.30, SD = 0.29). Moreover, subgroup 2 also exhibited significantly lower scores on the professional integration perspective (M = 3.23, SD = 0.26) than ICPs in subgroup 1 and subgroup 3 (M = 3.61, SD = 0.19; M = 3.60, SD = 0.28 respectively).

Subgroup 3: Professional-oriented Integration Perspectives (PIP)

ICPs in this group comprised 40.5% (n = 17) of the sample. ICPs were characterized by low system integration scores, average organisation integration scores and high professional integration scores (see Table 4), and thus labelled as "Professional-oriented Integration Perspective (PIP)." ICPs in subgroup 3 exhibited significant lower scores on the system integration perspective (M = 2.29, SD = 0.25) than ICPs in subgroup 1 and subgroup 2 (M = 3.00, SD = 0.00; M = 2.89, SD = 0.22 respectively).

Change in collaboration processes (research question 2)

No significant differences were found between subgroups in change in collaboration process

variables with the multivariate test (F(10,72) = 1.57, ns). Significant differences were found between subgroups for changes over time in mutual gains (F(2, 39) = 4.44, p = .02); relationship dynamics (F(2, 39) = 3.82, p = .03); organisation dynamics (F(2, 39) = 5.42, p = .008) and process management (F(2, 39) = 5.68, p = .007). No statistically significant differences between the subgroups were found in regard to change in shared ambitions (F(2, 39) = 0.96, ns).

Subgroup 1: United Integration Perspectives (UIP)

ICPs in subgroup 1 made a substantial increase in the collaboration process variables over time (see Table 4). Post hoc comparisons revealed that ICPs in subgroup 1 exhibited a significant increase in mutual gains (M = 0.04, SD = 0.09) and relationship dynamics (M = 0.05, SD = 0.07) over time compared to ICPs in subgroup 2 (M = -0.10, SD = 0.11; M = -0.05, SD = 0.12, respectively). The increases in shared ambition and process management over time did not significant differ compared to ICPs in subgroup 2 and 3.

Subgroup 2: Disunited Integration Perspectives (DIP)

ICPs in subgroup 2 were characterized by a substantial decrease in the collaboration process variables over time (see Table 4). Interestingly, ICPs in subgroup 2 exhibited a significant decrease in organisational dynamics (M = -0.08, SD = 0.12) compared to ICPs in subgroup 1 (M = 0.06, SD = 0.09) and subgroup 3 (M = 0.05, SD = 0.11). ICPs in subgroup 2 also showed a significantly decrease in mutual gains (M = -0.10, SD = 0.11) and relationship dynamics (M = -0.05, SD = 0.12) over time compared to the ICPs in subgroup 1 (M = 0.04, SD = 0.09; M = 0.05, SD = 0.07, respectively). Moreover, subgroup 2 ICPs also exhibited a significant decrease in process management (M = -0.07, SD = 0.14) over time compared to ICPs in subgroup 3 (M = 0.08, SD = 0.10).

Subgroup 3: Professional-oriented Integration Perspectives (PIP)

The collaboration process variables in subgroup 3 increased over time (see Table 4). ICPs in subgroup 3 exhibited significantly higher scores on organisational dynamics (M = 0.05, SD = 0.11) then ICPs in subgroup 2 (M = -0.08, SD = 0.12), but did not differ in shared ambition, mutual gains and relationship dynamics scores compared to subgroup 1 and 2 (see Table 3). However, ICPs in subgroup 3 had significant higher scores on process management (M = 0.08, SD = 0.10) over time compared to the ICPs in subgroup 2 (M = -0.07, SD = 0.14).

Perceived effectiveness (research question 3)

The subgroups differed significant on perceived effectiveness among ICPs using a multivariate test (F (6, 70) = 4.93, p < .001). Significant differences between subgroups were found for the perceived effectiveness at system (F(2, 38) = 5.63, p = .007), organisational (F(2, 39) = 16.43, p < .001) and professional (F(2, 36) = 5.70, p=.007) levels.

Subgroup 1: United Integration Perspectives (UIP)

ICPs in subgroup 1 were characterized by average effectiveness rates at the professional level combined with high effectiveness rates at the organisational and system level (see Table 3). Post hoc comparisons indicated that ICPs in subgroup 1 exhibited significant higher effectiveness rates at the organisational level (M = 7.72, SD = 0.37) and system level (M = 4.07, SD = 0.46) compared with ICPs in subgroup 2 (M = 6.20, SD = 0.93; M = 3.22, SD = 0.97, respectively).

Subgroup 2: Disunited Integration Perspectives (DIP)

ICPs in subgroup 2 were characterized by relatively low effectiveness scores at the system, organisational and professional level (see Table 4). ICPs in subgroup 2 exhibited significant lower effectiveness rates at the system level (M = 3.22, SD = 0.97) compared to ICPs in subgroup 1 (M = 4.07, SD = 0.46). Moreover, they also exhibited the lowest organisational effectiveness rates (M = 6.20, SD = 0.93) compared to ICP's in subgroup 1 (M = 7.72, SD = 0.37) and subgroup 3 (M = 7.23, SD = 0.66). Finally, they also exhibited significant lower effectiveness scores at the professional level (M = 3.71, SD = 0.18) compared to ICPs in subgroup 3 (M = 4.15, SD = 0.36).

Subgroup 3: Professional-oriented Integration Perspectives (PIP)

ICPs in subgroup 3 were characterized by average effectiveness scores at the system and organisational level combined with high effectiveness rates at the professional level (see Table 3). ICPs in subgroup 3 exhibited significant higher effectiveness rates at the organisational (M = 7.23, SD = 0.66) and professional (M = 4.15, SD = 0.36) level compared to ICP's in subgroup 2 (M = 6.20, SD = 0.93; M = 3.71, SD = 0.18, respectively).

Table 4: Characteristics of the subgroups and tests of differences between groups

	Total	Subgroup 1 United Integration Perspectives (UIP)	Subgroup 2 Disunited Integration Perspectives (DIP)	Subgroup 3 Professional-oriented Integration Perspectives (PIP)	Subgroup differences
n (%)	42	16 (38.1)	9 (21.4)	17 (40.5)	F-tests
Degree of integration - mean (SD)					Multivariate F (6, 76) =25.95***
System integration	2.69 (0.38)	3.00 (0.00)a	2.89 (0.22)a	2.29 (0.25)b	F (2, 39) = 26.67***
Organisational integration	3.29 (0.34)	3.52 (0.17)a	2.87 (0.22)b	3.30 (0.29)c	F (2, 39) = 21.58***
Professional integration	3.52 (0.28)	3.61 (0.19)a	3.23 (0.26)b	3.60 (0.28)a	F (2, 39) = 9.18**
Change in collaboration process - mean (SD)					Multivariate F (10, 72) = 1.57
Shared ambition	0.01 (0.10)	0.02 (0.06)	-0.03 (0.10)	0.02 (0.10)	F(2, 39) = 0.96
Mutual gains	-0.00 (0.12)	0.04 (0.09)a	-0.10 (0.11)b	0.01 (0.12)	F(2, 39) = 4.44*
Relationship dynamics	0.03 (0.10)	0.05 (0.07)a	-0.05 (0.12)b	0.04 (0.10)	F(2, 39) = 3.82*
Organisation dynamics	0.03 (0.12)	0.06 (0.09)a	-0.08 (0.12)b	0.05 (0.11)a	F(2, 39) = 5.42**
Process management	0.03 (0.12)	0.04 (0.09)	-0.07 (0.14)a	0.08 (0.10)b	F(2, 39) = 5.68**
Perceived effectiveness - mean (SD)					Multivariate F (6, 70) = 4.93***
System level	3.76 (0.66)	4.07 (0.46)a	3.22 (0.97)b	3.76 (0.44)	F(2, 38) = 5.63**
Organisational level	7.20 (0.84)	7.72 (0.37)a	6.2 (0.93)b	7.23 (0.66)a	F(2, 39) = 16.43***
Professional level	4.01 (0.33)	4.02 (0.28)	3.71 (0.18)a	4.15 (0.36)b	F(2, 36) = 5.70**

***= $p < .001$, **= $p < .01$, *= $p < .05$. Means that do not share the same subscript (a, b or c) differ in the Bonferroni-adjusted post-hoc comparisons ($p < .05$).

DISCUSSION

Based on the perceived degree of integration from a multiple stakeholders' perspective (professionals, managers and policymakers), ICPs were segmented into three subgroups, which we named: 'United Integration Perspectives (UIP)', 'Disunited Integration Perspectives (DIP)' and 'Professional-oriented Integration Perspectives (PIP)'. The ICPs within the UIP subgroup were perceived as most effective, had the highest perceived degree of integration at the organisational and system levels and average scores at the professional level. The DIP subgroup ICPs were characterized with the lowest perceived effectiveness, lowest degree of integration at all levels. The ICPs within the PIP subgroup were characterised by an average degree of perceived effectiveness, lowest perceived degree of integration at the system level and average scores at the organisational and professional level. Both the UIP and PIP subgroups showed an increase in collaboration processes over time. ICPs within the DIP subgroup were characterized by a decrease in collaboration processes over time.

Contribution of research findings

These findings support the recent theories form the literature that the effectiveness of an ICP is improved when all stakeholders (professionals, managers and policymakers) are aligned. In other words, our study highlights the need to develop a multilayer commitment from professionals, organisations and system actors when leading integrated care efforts [2, 8, 11, 16, 22, 27, 46, 47].

Furthermore, ICPs within the PIP subgroup showed a gap between professional and system perspectives in the development of integrated care. The ICP interviewees' low perceived degree of system integration and relatively high degree of professional integration as well as the high perceived effectiveness at the professional level displays different integration perspectives of professional and system level stakeholders. The literature suggests that environmental policy conditions (e.g. public laws and regulations) can be counteracting forces in achieving operational integration goals [1, 16, 48]. In this context, the low degree of system integration may indicate that local health policy reforms (e.g. transitions from the Exceptional Medical Expenses Act to the existing Social Support Act and new Long-Term Care Act in The Netherlands) [49] during the 'Primary Focus programme' may have had a negative effect upon ICPs in the PIP subgroup. However, much variation existed between the objectives of the ICPs and the complexity of their system environment (e.g. urban vs. rural). Future studies should focus in more detail on how system features interact with the content of integration initiatives.

Another explanation for the opposing system integration and professional integration effectiveness scores could be that there is a glass ceiling at the organisational level when developing integrated care in practice. The observed changes in the collaboration processes over time as well as the degree of organisational integration between the PIP and UIP subgroups indicated that the development towards integrated care varied. For example, ICPs within the PIP subgroup displayed a strong increase in 'transactional' control-based (organisational dynamics and process management) collaboration mechanisms over time. Arguably, the organisational

level (steering committees) of these ICPs were focused on controlling power struggles and/or conflicts of interests particularly associated with developing integrated care across professional boundaries [11, 16-21, 50]. In comparison, ICPs within the UIP subgroup showed a strong increase in 'relational' trust-based (mutual gains and relationship dynamics) collaboration approaches in addition to the control-based mechanisms. Interestingly, the UIP subgroup showed the strongest increase in the mutual gains approach, suggesting that the effectiveness of an ICP improves when the conflicting interests and motives across professionals, managers and policymakers are successfully aligned and bridged at the organisational level [10, 16, 26, 29]. This might suggest that both relational trust- and functional control-based collaboration processes are of crucial importance to successfully develop and align integration efforts at the professional, organisational and system levels.

Finally, no significant differences in shared ambition (e.g. vision and mission of the ICPs) between the three subgroups were found, even though a shared consensus on the collaboration purpose is considered an essential process condition for achieving integrated care [16, 27, 51]. One reason that we did not found any differences between the shared ambition among the subgroups might be related to the selection criteria of the funding agency, in that, in order to be selected, the majority of projects had to show a prior history of collaboration [10]. Consistent with our previous study, this finding indicates that a shared ambition is rather a precondition then a crucial process condition of an effective integration strategy, since integrated care initiatives all begin as a shared vision by all the stakeholders [10].

Strengths and weaknesses of this study

Identifying subgroups of ICPs using cluster analysis has provided an excellent way to study the complex nature of integrated care through a multifocal perspective. Likewise, incorporating three different actor-group perspectives holds more external validity and generalizability than studying integrated care from one perspective only (as conducted in earlier studies). The present study provides persuasive empirical evidence for a typology of integrated care and how integrated care is effectively developed through changes in collaboration processes over time. The differences across the three subgroups in terms of the development of their collaboration processes and their final perceived effectiveness provides valuable implementation knowledge in the burgeoning field of integrated primary care.

Several limitations of the present study are notable. This study highlighted the problems associated with collecting data from multiple stakeholders' perspectives. As noted earlier, patient experiences of integrated care could, unfortunately, not be included, mostly due to resistance among ICPs to measure the degree of integration among their patients. Although the selection criteria of the funding agency explicitly stated that patients' should be central in the integration process, the majority of the ICPs argued that measuring the experience of care was not part of the Primary Focus programme because the principle objectives were focused on governance structures [10]. Including the patient perspective is important not only for its positive association with patient safety and clinical effectiveness [52], but also as an organising

principle to restructure services around the needs and values of people [1, 8]. Since patients tend to have different preferences compared to other stakeholder groups [53], selection bias is likely to have influenced the construction of the ICPs typology. Further validation of the link between the typology of ICPs and the patient experience of integrated care is, therefore, required. Only a limited number of studies have attempted to describe or evaluate the concept of integrated care from the perspective of patients [54], in part, by a lack of research methods. This study must therefore be seen as an important first step towards future multilevel evaluation studies that incorporate the patient perspective in addition to the professional, managerial and policy perspectives on integrated care.

Due to the principal objectives of the Primary Focus programme, the research team established better relationships at the organisational level compared to the professional and clinical level. This is reflected in the higher response rate at organisational level (87%) compared to the professional level (37%).The organisational level, and hence the managerial perspective might, be overrepresented in the present study. We are aware of the fact that the possible existence of selection and response bias could have influenced the results of our study. For example, we were only able to measure the development of collaboration processes at the organisational level. As a consequence, positive results regarding the collaboration process might be overrepresented by the steering committee members in order to be perceived more favourably for future funding [10]. Caution should, therefore, be taken when generalising the results of this study, because effective integration strategies in one setting may not be transferable to other settings (e.g. secondary and tertiary care) and countries, due to differing cultural and organisational contexts [2, 55].

Finally, this study assessed the various actors' perceptions about their ICP behaviours; whether these behaviours actually do affect the outcomes, and in what fashion, remains to be empirically tested. The present study used the stakeholders' effectiveness perspectives as a proxy for the ICP performance. By definition, the use of self-reported data involves risks of social desirability and differences in recall [10, 56]. Further research is needed to link the typology of ICPs with more objective health and cost-related outcomes. Unfortunately, this particular analysis could not be done in the present study because the necessary data was unavailable. Nevertheless, the academic literature has only just begun to understand and study the complex field of integrated primary care through a multifocal perspective and the results derived thus far encourage further research.

Implications for practice and future research

This study provides valuable implementation knowledge for professionals, managers, commissioners, and policymakers on how to develop effective integration strategies in a primary care context. The typology of ICPs is an important step to understand the concept of integrated primary care and to compare different types of collaborating professionals and organisations. The typology can be used as a framework for assessing performance in terms of quality, cost and health outcomes and diagnosing the integration and collaboration characteristics across

multiple types of organisations [50]. Moreover, the typology provides a potential diagnostic tool for professionals, managers, commissioners, and policymakers to analyse their integrated care arrangements' which, subsequently, can be used to customise integrated care strategies to local circumstances to make them more effective.

The subgroups of integration found in this study emphasize the need and value of theorizing, studying and developing integrated care through a multifocal perspective. The empirical recognition that aligned stakeholders' perspectives towards integrated care are related to changes in underlying collaboration processes supports the hypothesis that integrated care is a complex interdisciplinary, nonlinear and dynamic change process [17, 18, 22, 57]. Thus, to understand how integrated care functions, it is necessary to use and develop research methodologies that acknowledge a complex philosophy of science [58].

Future research in this area should, therefore, focus on the entire complexity of inter-relationships among all the actors involved within an integrated care initiative. In this regard, future studies should investigate in more detail the balance between opposing professional and system perspectives of integration and the need of relational trust- versus transactional control-based collaboration mechanisms to bridge the different, and sometimes polar, perspectives. Social Network Analysis (SNA) [59, 60] can be an useful aid to further study and understand these complex dynamics of integrated care. Once researchers are able to quantify and visualise these complex interactions, an understanding of which integrated care strategies can lead to better patient outcomes relative to the amount of money spent within a specific context might emerge. In their entirety, the results of this exploratory study highlight the need for cross-level theories and performance evaluations to determine how best to accelerate the progress of value-based integrated care.

CONCLUSIONS

The typology of ICPs provides evidence that final effectiveness is improved when all stakeholders (professionals, managers and policymakers) perceive a high degree of integration. This finding highlights the need to develop a multilayer commitment when leading integrated care efforts. In this regard, both trust- and control-based collaboration processes are critical for bridging the gap of opposing integration perspectives between stakeholders at the professional and organisational system levels. Our findings underscore the value of theorizing, evaluating and developing integrated care through a multifocal perspective to enhance a more complete understanding of the best way to establish successful integrated care interventions.

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ADDITIONAL FILE 1: DATA COLLECTION PROCEDURE SYSTEM LEVEL

A step-by-step thematic analysis procedure was followed to enable an overall quantitative analysis for the system level variables: system integration and perceived effectiveness. The coding process was conducted in three steps using the following materials: 1) Semi-structured interview scheme, 2) Qualitative template, and 3) Coding scheme.

Step 1: Semi-structured interview scheme

The following interview scheme was used to obtain information about the fit between the strategic objectives and the policy conditions (e.g. public laws and regulations) and the final success of the ICPs.

External environment of the project

1. To what extent are policy regulations (e.g. laws and funding schemes) a barrier for achieving the goals of the project?
    - □ No barrier
    - □ Very small barrier
    - □ Small barrier
    - □ Reasonable barrier
    - □ Major barrier
    - □ I don't know
2. Could you give an example of how policy regulations (e.g. laws and funding schemes) hamper the project?
3. Is there a solution to this barrier within your project?
4. Are there other policy regulations barring the achievement of the project goals?

Results of the project

5. Which results have been achieved within the project?
6. Which are you most proud of?
7. Could you give examples of the specific products and/or services that have been realised?

Step 2: Qualitative template

The qualitative template was used to analyse, code and summarise the interview data for each ICP (see Step 1).

External environment of the project

Are policy regulations (e.g. laws and funding schemes) a barrier for achieving the goals of the project?	
Quantitative summary	<table><tr><th>Respondent 1</th><th>Respondent 2</th><th>Respondent 3</th></tr><tr><td>No barrier/ Very small barrier/ Small barrier/ Reasonable barrier /Major barrier/ I don't know</td><td>No barrier/ Very small barrier/ Small barrier/ Reasonable barrier /Major barrier/ I don't know</td><td>No barrier/ Very small barrier/ Small barrier/ Reasonable barrier /Major barrier/ I don't know</td></tr><tr><td>Explanatory note</td><td>Explanatory note</td><td>Explanatory note</td></tr></table>
Qualitative summary	

Results of the project	
Qualitative summary	

Step 3: Coding scheme for interviewers

The coding scheme was used to quantitatively rate the degree of system integration and final success of the ICP using the content qualitative templates (see Step 2).

External environment of the project

1. Is the implementation of the project facilitated by policy regulations (e.g. laws and funding schemes)?
   - □ Not at all (e.g. Public regulations hamper the implementation.)
   - □ Partially (e.g. Public regulations partially facilitate the implementation.)
   - □ Completely (e.g. Public regulations facilitate the implementation.)

Results of the project

2. To what extent do you think the project is successfully executed (e.g. goal achievement)?
   - □ Very unsuccessful
   - □ Unsuccessful
   - □ Neutral
   - □ Successful
   - □ Very successful

CHAPTER 7

GENERAL DISCUSSION

INTRODUCTION

Integrated primary care services are considered a vital strategy for maintaining sustainable and affordable healthcare provisions [1-3]. However, a solid scholarly explanation about the concept of integrated primary care and knowledge of its accompanying critical collaboration processes for success is limited. The main aim of this thesis is to contribute to a better understanding of what integrated primary care is, and how it can be achieved by focussing on the collaboration processes that underlie its development. This thesis was divided into two parts to address the leading research questions:

Part I: What is integrated care in the context of primary care?

Part II: What is the role of collaboration in the development of integrated primary care?

The first question, addressed in Part I and discussed in Chapters 2, 3 and 4, led to the reconfiguration and operationalisation of the concept of integrated care from a primary care perspective. The second question, formulated in Chapters 5 and 6, explored the development of collaboration processes and their relationship to the degree of integration effectiveness within a primary care setting. This general discussion summarises the main findings with regard to the research questions. Subsequently, the theoretical and methodological considerations of this thesis are discussed in this general discussion. Finally, this general discussion ends with recommendations for research, policy and practice.

MAIN FINDINGS

Part I: What is integrated care in the context of primary care?

Based on the theoretical assumptions of integrated care and primary care, the Rainbow Model of Integrated Care (RMIC) was developed to grasp the complex and multi-dimensional nature of integrated care (for details, see Chapter 2). This model distinguishes two primary care guiding principles: person-focused and population-based; and six domains of integrated care: clinical, professional, organisational, system, functional and normative integration. In the RMIC, integrated care plays a complementary role at the micro level of clinical integration, the meso level of professional and organisational integration, and the macro level of system integration. Functional and normative integration are conceptualized as enablers to ensure connectivity between the levels. The RMIC visualises that integrated care can be pursued at different levels within a system to facilitate the continuous, comprehensive, and coordinated delivery of services for individuals and populations.

Further insight into the underlying features of the various domains was needed in order to make the model applicable for evaluation purposes (see Chapter 3). Firstly, a literature review and thematic analysis procedure were conducted to refine the RMIC into a taxonomy of fifty-nine key features. Thereafter, Delphi studies among experts from various countries were performed to develop an international consensus-based taxonomy (see Chapter 4). The results showed

that the experts were particularly focused on the features linked to the clinical, professional and organisational domains of integration, while features linked to the 'macro' system integration domain were generally neglected. The results of the Delphi studies enabled the taxonomy to be revised into consisting of twenty-one key features organised into three main categories: scope (person-focused vs. population-based), type (clinical, professional, organisational and system) and enablers (functional vs. normative). The three main categories of the taxonomy provide a crucial differentiation for the clarification and interpretation of practical examples of integrated care. For example, specifying the scope of an integrated care approach as either person-oriented or population-oriented helps to understand and describe the guiding principles and objectives of an integrated care initiative. In addition, the types of integration processes can be used to explore the (dis)similarity of integration mind-sets between stakeholders at the clinical, professional, organisational and system levels of integration. Finally, the enablers assist in clarifying and interpreting the technical (functional) and cultural (normative) enablers needed to achieve the common goals and optimal results of an integration effort. Profiling integrated primary care efforts along such a taxonomy makes it possible to obtain comprehensive and systematic information, and promote the learning and sharing of best practices.

Part II: What is the role of collaboration in the development of integrated primary care?

This question, explored in the second part of this thesis, appears in Chapters 5 and 6. A longitudinal study among a sample of 59 integrated primary care projects in The Netherlands was used to explore the importance of collaboration processes in the development of integrated care (Chapter 5). Several interpersonal conditions played a role at the start and in the development of integrated care initiatives, such as mutual gains, relationship dynamics, organisational dynamics (shared control) and process management. Mutual gains and process management pertain to the acknowledgement of the various interests between partners and the steering of the collaboration process. Such interpersonal conditions were essential prerequisites from the start for the successfully development of integrated primary care initiatives. Over time, an increase in relationship capital was associated with a successful development of integrated primary care. These results suggested that trust-based governance mechanisms (i.e. mutual gains and relational capital) are of more importance than control-based mechanisms (i.e. process management) in the development of integrated primary care projects.

A second sample of 42 integrated primary care projects was then used to assess how changes in collaboration conditions over time are related to the perceived degree of integration effectiveness between stakeholders at the professional, organisational and system levels (Chapter 6). The (dis)similarity of integration mind-sets between stakeholders was used to identify a typology of integrated primary care projects. Analyses resulted in a 'United Integration Perspectives (UIP)' subgroup, a 'Disunited Integration Perspectives (DIP)' subgroup, and a 'Professional-oriented Integration Perspectives (PIP)' subgroup. Changes in collaboration conditions in the subgroups were contrasted over time as well as their final perceived effectiveness rates among

stakeholders. The projects with an UIP achieved the strongest increase in trust-based (mutual gains and relationship dynamics) and control-based (organisational dynamics and process management) collaboration conditions and had the highest overall effectiveness rates among stakeholders. In contrast, projects with a DIP decreased on collaboration conditions and had the lowest overall effectiveness rates among all stakeholders. Projects with a PIP increased in control-based collaboration conditions (organisational dynamics and process management) and showed the highest effectiveness rates among professionals. These findings highlighted the need for multiple stakeholders to have a similar integration mind-set in order for an integrated care project to be effective. Aligning disunited integration viewpoints requires both trust-based and control-based collaboration conditions. To conclude, interpersonal collaboration conditions involved in the development of integrated care were essential for achieving the collaborative advantage of an integrated care initiative.

THEORETICAL CONSIDERATIONS

The theoretical considerations of this thesis are addressed in relation to the value and epistemological nature of integrated primary care.

The multidimensional value game

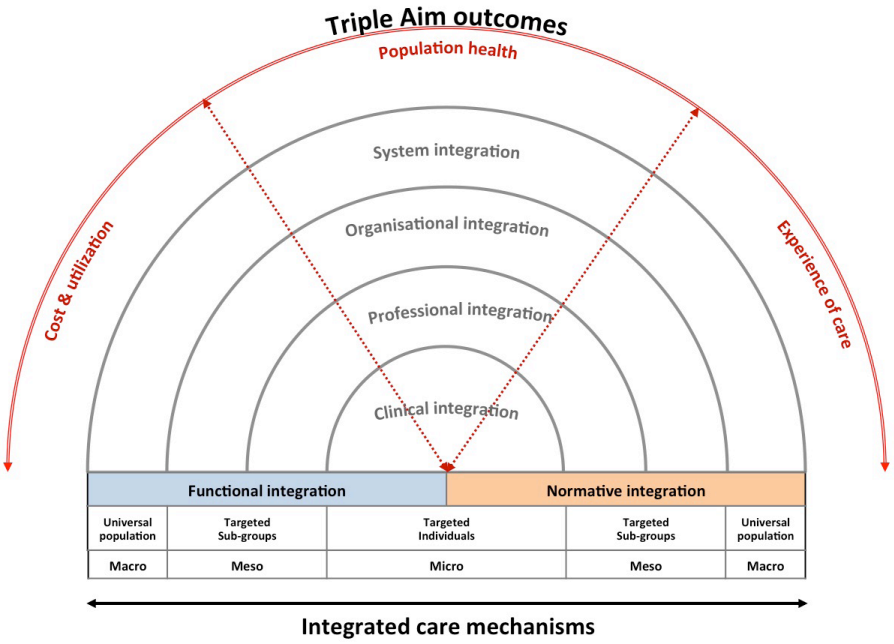
Earlier theories and models on integrated care lack a clear primary care perspective [4-6]. Nevertheless, the advantage of a primary care perspective is that it is based on 'micro' (individual) as well as 'macro' (population) dimensions of health. The RMIC presented in the theoretical part of this thesis contributes to a deeper understanding of the complex multi-dimensional nature of integrated care. The RMIC and its final taxonomy provide a synthesis of the current knowledge and theories on integrated care and primary care into one overarching theoretical perspective. This thesis provides a theory which underpins how integration efforts (clinical, professional, organisational and system) act at different levels (micro, meso and macro) and can be defined from multiple stakeholder perspectives (patients, professionals, managers and policymakers). Whereas previous models on integrated care tend to focus solely on isolated macro, meso or micro levels of integration [4-6], the current findings highlights the fact that the different levels and perspectives are, in fact, interrelated. In addition, this finding leads to the recognition that the economies of scale and the scope of the different types of integration are linked to the volumes or risks (prevalence) within a targeted population. For example, the prevalence within a targeted population has to be large enough to achieve the quality and efficiency benefits of an organisational integration effort at the meso level [7]. Therefore, the theoretical analysis in this thesis was urgently required due to the lack of evidence into the relationship between the economies of scales and the scope of the different types or patterns of integration and the needed prevalence within a population.

The theoretical analysis also led to the understanding that both 'hard' functional (e.g. IT, financial incentives) and 'soft' normative (e.g. cultural values) mechanisms are essential enablers

for encouraging widespread implementation of integrated care. To date, most studies and theories on integrated care have focused on the functional aspects and have not taken into account the normative mechanisms for the development of integrated care [4-6, 8]. In contrast, the second part of this thesis showed that 'normative' collaboration mechanisms at the meso level clearly influence the development of integrated care. This finding emphasises the value of monitoring the 'normative' collaboration processes that underlie the development of integrated care.

Although the theoretical and empirical findings of this thesis contributed to the unravelling of the concept of integrated care, it remains unclear how integrated care affects the outcomes of care. The majority of previous research has focused on the outcomes of integrated care, without divulging any comprehensive insights into how and why an integration effort contributes to effectiveness [9, 10]. Based on their lack of research into how integrated care mechanisms act as a means for effectiveness, such studies lead to conceptually weak and inconsistent findings. Nevertheless, there is an ever-increasing demand to demonstrate the value of integrated care in terms of improved health outcomes relative to the amount of money spent [11, 12]. To bridge this gap, there is a need to link the current theoretical rationales of the concept of integrated care with health and cost-related outcomes. One possible answer to specifying the predetermined endpoints of integrated care is to link the RMIC with the three interdependent outcomes of the Triple Aim framework [1] in terms of patients' experiences of care, population health and healthcare costs per capita. This three-dimensional value perspective (patient, social and economic) corresponds with the theoretical discourses on primary care and integrated care [3, 13].

Figure 1 shows a schematic illustration that combines the RMIC and Triple Aim framework into one comprehensive model. The revised RMIC highlights that the development of integrated care should start with a careful analysis of the needs and system requirements to explore which integration strategy is best suited for whom. The challenge in the future is to explore which integrated care mechanisms achieve better health at a lower cost within a specific context. For this purpose, the revised RMIC has set a development agenda for research and practice on integrated (primary) care.



Source: Adapted from Valentijn (2013) [14] and Berwick (2008) [1]

Figure 1: The revised RMIC, a three-dimensional value perspective on integrated care

Determinism or inter-determinism

This thesis shows that the development of integrated care in a primary care context can be described as a "complex adaptive system" as its features adhere to the principles of complexity theory. Complexity science focuses on the relationship between the elements (such as persons or organisations) rather than on each element alone within the system [15, 16]. Such thinking resonates very closely with the concept of integrated primary care in which stakeholders from various sectors commonly pursue the improvement of a population's health. Complexity science also emphasises that cause and effect relationships are based on organic, nonlinear patterns that are non-predictable but potentially understandable through (retrospective) pattern observation [16, 17]. The main reason for such cause and effect relationships is that complex adaptive systems have a strong tendency to learn, adapt and self-organise in response to continuous feedback from changing patterns of relationships and interactions among stakeholders and their environment [16, 18, 19]. From a complexity science perspective, the development of integrated care in a primary care context has design and management limitations, since no player has the ultimate authority or resources to design or control the system [18]. In more concrete terms, one single stakeholder (i.e. financier, government) cannot control the health, social, political and economic systems that influence people's health and well-being. In addition, one cannot assume that a single stakeholder is able and willing to manage the complexity of the entire

system [18]. As a result, the behaviour of the stakeholders can usually be more easily influenced than controlled [16, 18]. Not surprisingly, a complexity science perspective contrasts sharply with the traditional mechanistic views of integrated care, which promote linear cause and effect relationships which are predictable and manageable through orderly planning and control [16-18, 20]. Table 1 outlines some of the contrasts between the traditional quality paradigm and the complexity paradigm.

Table 1: Comparison of traditional versus complexity paradigm

	Traditional perspective	Complexity perspective
Scientific paradigm	Reductionism, determinism	Holism, interdeterminism
	Linear relationships	Non-linear relationships
	Newtonian physics	Quantum physics
Knowledge type	Known – knowable (potentially ascertainable and predictable by decomposition of elements)	Understandable (non-predictable, but potentially understandable by pattern observation)
	Focus on averages	Focus on variation
Value philosophy	Efficiency (market power, cost/ risks)	Agility (learning, innovation, entrepreneurship)
	Focus on inputs	Focus on outputs
Design principles	Process engineering	Complex adaptive social systems
	Behaviour specified from top down	Behaviour emerges from bottom up
	Hierarchy	Heterarchy
	Command and control	Incentives and inhibitions
	Contractual	Personal commitments

Adapted from: Begun et al. (2003) [16], Rouse (2008) [18] and Glouberman and Zimmerman (2002) [17].

Insights from the complexity philosophy of science are supported by the findings in this thesis in which the development of effective integrated primary care is linked to interpersonal collaboration mechanisms. It can be argued that the development of a simplified taxonomy of features is artificial from a complexity science point of view. Granted, such a simplification of reality is highly desirable for the development of clear methods and approaches on how to model the complexity of integrated care in practice. While the complexity paradigm is by definition nonlinear and unrestrictive, it does not exclude new research that develops models for further research and practice through which to understand the complexity of integrated care and its implications. The complexity paradigm actually supports and justifies the development of pioneering research designs, methods and instruments that are essential to unravelling and analysing the complex interactions of multiple integrated care interventions at the clinical, professional, organisational and system levels.

METHODOLOGICAL CONSIDERATIONS

Apart from the specific strengths and limitations of the studies described in earlier chapters of this thesis, this section addresses general methodological issues.

The theoretical knowledge synthesis

Given the splintered integrated care knowledge-base as well as the aim to synthesise findings into one overarching concept, a flexible mixed-method design was the most obvious choice for the theoretical part of this thesis. The major advantage of this approach was that it unified the available theories on integrated care across heterogeneous research disciplines and tested it against a wide array of expert opinions.

Although the results of the theoretical part of this thesis are promising, some limitations need to be considered. First, there are no universal criteria for qualitative synthesis methods such as the thematic analysis method used [21-23]. Since agreed upon quality criteria and procedures are missing, these methods might be exposed to selection and confirmation bias. This limitation was anticipated through the application of various quality criteria to ensure the thematic analysis procedure was systematic and independently verifiable. Nonetheless, subjective judgements could have influenced the development process. Second, the results of the Delphi studies only represent professional (i.e. practical and scientific) values, preferences and opinions regarding integrated care. Experts with a practical and scientific background were purposeful selected in order to gain a complete overview of 'micro' operational and 'macro' system integration processes. Since other key stakeholders like patients or health insurers tend to have different preferences [24], selection bias of the composition of the expert panels is likely to have influenced the results. For example, the limited emphases on 'macro' system features as well as patient engagement features in the final taxonomy might be explained by the composition of the expert panel. In this regard, the final taxonomy should be seen as a contribution to the ongoing debate of defining and specifying the morphogenesis of integrated primary care.

The exploration of practice change

The second part of this thesis focused principally on the evolution of collaboration processes in practice. By deploying a longitudinal study design, the dynamic character of the collaboration process over time could be explored.

The main limitation of this study of practical collaboration over time is that the taxonomy developed in the theoretical part could not be applied in the empirical studies. The reason for this was the time frame of the separate studies, which made it impossible to base a workable assessment tool on the taxonomy and test it within the Primary Focus Programme. Since alternative appropriate instruments were unknown at the start of the programme, self-reported measures were developed based on insights gained from the literature. Although the measures did show good reliability and validity properties, there is scope for further improvement and refining. In the view of the known limitations of self-reported measures [25], further research

is needed to verify whether people's perceptions about their behaviour correspond with their actual integrated care behaviour (e.g. number of meetings, phone calls and e-mails between stakeholders).

From a theoretical point of view, one could argue that only normative 'subjective' aspects have been studied in the second part of this thesis and that functional 'objective' aspects were overlooked. On the other hand, most integrated care studies to date lack any insight into normative aspects [20, 26] which makes the normative insights from this particular part of the thesis highly valuable.

Another important point concerns the problems regarding the collecting of data from multiple stakeholders' perspectives. Unfortunately, this study failed to incorporate the patient perspective due to unwillingness among several integrated primary care projects of the programme to measure the degree of integration among their patients. Given the focus of the Primary Focus Programme on governance structures and its aim to stimulate inter-organisational integration research [27], relationships within the integrated care initiatives were mainly established at the 'meso' organisational level. As a consequence, the organisational level (and hence the managerial perspective) might be overrepresented in this thesis. In the future, the collection of objective as well as subjective data will remain a challenge given the large number of stakeholders (e.g. persons, organisations) involved, the (im)possibilities of current research methodologies and the costs of research and technologies needed to obtain the full picture of integrated care.

Lastly, the findings of the empirical part of this thesis cannot be generalised beyond the Dutch Primary Focus Programme sample without reservations. Since the selection and inclusion criteria of the Primary Focus Programme was based on a prior history of collaboration of the initiatives, potentially more sustainable integrated care initiatives might have been inherently selected. Given the fact that only a minority of the initiatives invested their own money, positive results regarding the collaboration processes might be overrepresented since initiatives would prefer receiving favourable status in order to increase their chances of receiving future agency funding. Further research is needed to verify whether the collaboration conditions found in this thesis also retain their value in other care settings and countries.

RECOMMENDATION FOR RESEARCH AND PRACTICE

The theoretical framework as well as the insights from the empirical studies revealed several implications for research and practice as described below.

Studying integrated care

The main implication of this thesis is that developing integrated care from a primary care perspective is a complex change strategy which typically involves multiple integration efforts at multiple levels. This implies that, in line with a complexity philosophy of science, more emphasis needs to be placed on theorizing, studying and modelling interaction patterns within and between the clinical, professional, organisational and system levels of integration. Future studies

should, therefore, focus in more detail on the inter-relationships between clinical, professional, organisational and system levels of integration by using multi-level evaluation designs. In order to assess the full spectrum of integrated care assessment, tools that incorporate the perspectives of the different stakeholders based on the RMIC and taxonomy proposed in this thesis should be developed and validated. Several studies are currently being conducted to further develop and validate the integrated care measures proposed in this thesis [28, 29]. Furthermore, methods such as Social Network Analysis [30, 31] that are able to model and visualise complex interaction patterns should be applied to study integrated care initiatives and, consequently, to support the stakeholder participation and collaboration in practice.

Research into the outcomes of integrated care is needed to reveal the value from multi-stakeholders' perspectives in terms of patient experience, population health and costs [1, 32]. Unfortunately, this particular research could not be done in the current study but is, nevertheless, highly needed to underpin the (added) value of integrated care and to obtain the needed support of all stakeholders in practice [33-35]. In addition, given the complex nature of integrated care, it is advisable to study the impacts of integrated care through (retrospective) pattern observation rather than using a linear cause-effect model [16, 17, 19, 20, 36] . The subsequent inference is that research should extend beyond the golden standard of random clinical trials [37] by using evaluation designs that focus on managing complexity by providing ways of monitoring and influencing system state, performance and stakeholders' behaviour [18, 38, 39]. As an alternative to traditional rigid evaluation methods, rapid cycle-evaluations hold much promise for simultaneously evaluating and developing integrated care efforts in an increasingly fast-paced environment [40-42]. Rapid-cycle evaluations can provide timely and actionable evidence as well as reveal possible adaptations to contingencies and, subsequently, help to customize integrated care strategies to local circumstances making them more effective. Thus, scientific knowledge needs to be interconnected with the inter-disciplinary fields of policy and practice in order to increase the value and diffusion of integrated care services.

Developing integrated care in practice

The scientific findings presented in this thesis have several implications for the key players in healthcare. The implications for the policy, organisational, professional and patient contexts are each discussed below.

The policy context

Decision-making authorities, such as national, local governments and payers, can apply the RMIC and taxonomy as a tool to guide the planning and the design of new regulations and performance standards. Enhancing the development of integrated care makes the most sense if it is based on registered populations and rooted in primary care that aims to achieve desired health outcomes and limited costs [1, 2, 43, 44]. This thesis showed two essential prerequisites that can stimulate the development and implementation of such an integrated primary care approach – namely, functional control and normative trust mechanisms. The development of

effective integrated care strategies was linked to normative trust mechanisms. This link, in turn, implies that the scope of development programmes and policies of integrated care need to go beyond focussing on functional 'cost' control mechanisms [45]. The likelihood of success is probably improved if both functional transactional and normative relational prerequisites are acknowledged [3, 20, 46-48]. Due to the complex and interrelated nature of healthcare in daily practice, regulatory policies can only stimulate the development of integrated care to a certain degree [18]. It is important for policymakers to recognise that it is the local context that matters the most [1, 32, 34, 49, 50]. The disadvantage of top-down functional 'control' mechanisms such as contracts and payment systems is that they attempt to over-specify the content of integrated care approaches which may not serve the needs of a local context [20]. Contractual mechanisms and payment systems should, therefore, leave a certain degree of freedom, since local organisations and professionals have the innate knowledge and power base to adapt services to the local needs of populations [16, 20, 51]. In other words, regulatory frameworks have to push experimentation and self-organisation from the bottom-up rather than prescribing a detailed blueprint policy. In practice, new contracting models should aim to hold local service providers accountable for outcomes and streamlining the delivery of patient care across the entire care continuum [52-55]. In this way, a more purposeful transition towards integrated primary care that meets the financial challenges and local needs of the population might be achieved.

The organisational context

The managerial capacity of a small scale practice is entirely unable to meet the challenge of managing the risks and outcomes of a population. As a result, network-like partnerships between local hospitals, public health agencies, health and social services are needed to collectively bear the responsibilities and to manage the financial and clinical risks for a population [32, 52, 54]. Perhaps the biggest obstacle to the widespread development of integrated primary care will be the alignment of the hodgepodge of numerous organisations into a body that can effectively collaborate. Throughout this thesis research, data showed that successful integrated care efforts start with a focus on the potential inter-organisational conflicts and power struggles rather than only relying on collective opportunities. In practice, organisational interests are often swept under the carpet by managers and professionals to keep the peace within an existing partnership [56]. Under such circumstances, the development of integrated care can only remain a voluntary minority sport only played by attracted enthusiasts who are keen to innovate [57]. Instead, managers and professionals will have to acquire skills for negotiation and collective decision-making to successfully ground integrated care in practice.

The success will also depend on local organisations viewing themselves as ensuring medical, social and economic value for a population, rather than being reimbursed for the costs of their individual services [12, 18]. In this regard, there clearly is a need for modifications in incentives and removal of inhibitions that prevent local organisations from continually increasing value and becoming collectively accountable for a local population. In this light, outcomes as well as integrated care efforts must be incentivised and payment to organisations and professionals

should reflect the risk-adjusted value of the outcomes achieved within a specific population (i.e. population management) [52-55]. Such incentives go hand-in-hand with the challenges of shared accountability and measurability. This implies that internal as well as collective control of quality and efficiency will need to be significantly improved through better information management systems that report patient, population, financial and other business intelligence information.

Examples of successful best practices in the US context like Kaiser Permanente, Geisinger and the Mayo clinic all have started to invest in functional tools and systems to manage the financial and clinical risks and improve the internal business operations [58]. In contrast, the present reality in The Netherlands is that such aligned information systems are lacking. Without these functional tools, organisations lack the skills and capacity to translate the local needs of populations into high quality and affordable integrated care business models. In the future, organisations will have to unite their overall goals by investing in sustainable partnerships and sophisticated information management systems. Once that collaborative effort is established, then the organisations can gain the confidence among decision-making authorities of their ability to handle the risks and responsibilities for delivering integrated care at scale.

The professional context

At the heart of integrated primary care is clinical and inter-professional collaboration. Hence, the alignment of professionals within the rise of new inter-organisational partnerships must be created [59-61]. This necessity poses challenges given the intrinsically conflicting nature between the professional and managerial lifeworld highlighted in this thesis. Nevertheless, this thesis also showed that managers and professionals can effectively work together. Thus far, professionals are often considered 'victims' of managerial and organisational control principles, which has led to the dualistic debate between the need to protect professional spaces, standards and values versus the restriction of professional power and control [62]. In practice, professionals cannot escape having to (re)organise their work in order to manage the increasing number of people with complex and multiple problems and illnesses [63]. For example, professionals have to develop collective accountability standards to respond to the quality and safety risks at scale. However, as long as integrated care efforts merely increase professionals' workload while providing negligible clinical and/or financial advantages, the adoption of integrated care among professionals will continue to be a struggle.

As an alternative, successful development of integrated care should become a business-like affair which will further interweave the professional and organisational domains of integrated care [60]. To allow professionals to focus on the mainstream of clinical practice, new affordable, profitable business models need to be developed that can bear the responsibilities and risks of managing a population through inter-organisational risk sharing arrangements and contracts. In this light, the most successful integrated care models for the short-term will be those that can decrease the complexity for professionals and, instead, move the complexity to the organisational level where it can be managed. This reaffirms the fact that an isolated emphasis on professional work is losing its value and that new forms of organised professionalism are

called for [60, 62, 63]. Moreover, professionals will need to develop enhanced skills to set-up or work in inter-disciplinary as-well-as inter-organisational environments [64].

The patient context

Rising healthcare expenditure, dramatic changes in demography and illnesses and socio-technological transitions are unequivocally pointing in one direction – a new form of accountability in healthcare [65]. This accountability extends beyond the politicians, managers, professionals and service organisations to the patients, as the end result is, ultimately, their personal health. This thesis showed that in the field of integrated care in practice, however, the patient is too readily forgotten. Integration efforts that mainly focus on organisational integration efforts, such as the Primary Focus Programme, are unlikely to create improvements in patient care. Researchers, policymakers, managers and professionals should realise that developing integrated care is a participatory process of co-creation and collaboration with all key stakeholders involved, including the intended end-users. This process starts with identifying gaps in care and assessing the service-user needs within a targeted, at-risk population [1, 32]. Ultimately, through the identification of gaps in patient care, integrated primary care programmes can apply new integrated care models and methods that are better tailored to the end-users' needs and go beyond the current unidimensional corporate efficiency approach [66, 67].

If present trends continue, advances in medical science and informatics will likely catalyse the empowerment of patients. Such empowerment will undermine, both financially and socio-culturally, the entrenched position and traditional logic of professionals and their organisations. For example, precision diagnostic methods, personalisation of clinical diagnoses and treatments as well as information technology are moving to a world of 'precision medicine,' which will enable people to take better care of themselves, their health and their healthcare [68, 69]. In the long run, the primary force towards value-based integrated care will be a combination of technological advances and disruptive business models that can simplify the service delivery for patients [70]. Key recommendations from this thesis on when, how and why to integrate care supports the development towards a valued-based integrated care era.

CONCLUSION

This thesis shows that integrated care in a primary care context acts at the zone of complexity, where multiple activities undertaken at multiple levels are not predictable nor linear, but also not chaotic. Without doubt, no magic blueprint exists for the successful organisation of integrated care best suited for all contexts, settings and circumstances. Instead, integrated care is more of an 'art form' founded on a colourful pallet of beliefs, values, experiences and craft knowledge gained across various academic, political, organisational, professional and clinical fields. Both the functional 'transactional' approach as well as the normative 'relational' approach refers to design styles that frame this colourful picture together. Although this thesis demonstrates that constructive relationships are fundamental to developing integrated care in practice, it is naive

to assume that only 'trust' can bind the system together. Developing integrated care at the edge of chaos will no doubt require 'control' to reduce the complexity for patients and professionals by increasing the complexity where it can be managed – at the organisational level. Relying on normative relational approaches without the proper supporting functional tools and incentives does not seem to be a sustainable solution for the long-term development of integrated care. Grounding integrated primary care will require multiple perspectives that unite in a person-focused as well as population-based and value-driven vision.

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SUMMARY

SUMMARY

Integrated primary care services are considered a vital strategy for maintaining sustainable and affordable healthcare provisions. However, a solid scholarly explanation about the concept of integrated primary care and knowledge of the accompanying critical collaboration processes for success is limited. There is a growing need for a common knowledge base for integrated primary care in order to facilitate programme implementation, policy formulation and research. The main objective of this thesis is to contribute to a better understanding of what integrated primary care is, and how it can be achieved by focussing on the collaboration processes that underlie the development of integrated primary care. This thesis is divided into two parts to address the leading research questions:

1) What is integrated care in the context of primary care?
2) What is the role of collaboration in the development of integrated primary care?

In Part I of this thesis, which includes Chapters 2, 3 and 4, the concept of integrated primary care is reconfigured and operationalised. Chapter 2 introduces the Rainbow Model of Integrated Care (RMIC), which combines the concepts of primary care and integrated care by drawing on existing theories. Previous integrated care models lack a primary care perspective that is based on an encompassing inter-sectorial system approach with a distinct human and population focus of health. The RMIC model distinguishes these two primary care guiding principles – person-focused and population-based – and combines it with six domains of integrated care: clinical, professional, organisational, system, functional and normative integration. The RMIC shows that different integration processes play interconnected roles at the micro level of clinical integration, the meso level of professional and organisational integration, and the macro level of system integration. Functional and normative integration are conceptualized as enablers that ensure connectivity between the various levels. The RMIC visualises that integrated care can be pursued at different levels within a system to facilitate the continuous, comprehensive, and coordinated delivery of services for individuals and populations.

In order to make the RMIC applicable for science, policy and practice, the underlying features of the various domains were operationalised into a taxonomy. In **Chapter 3**, a draft taxonomy consisting of fifty-nine key features distributed across six integration domains (clinical, professional, organisational, system, functional and normative integration) was developed based upon a literature review and a qualitative analysis procedure. A Delphi study among experts with scientific and practice backgrounds in The Netherlands was conducted in order to investigate the appropriateness of the key features for the development of integrated primary care. The results of this study indicated that the majority of the key features associated with the clinical, professionals, organisational and normative dimensions of integration were considered appropriate. In addition, key features associated with the functional and system dimensions of integration were considered less appropriate for the development of integrated care in a

primary care context. This infers that expert opinion regarding integrated care has a more limited scope compared to the theoretical discourse of integrated care. The results of this Delphi study indicated that further research was needed in order to develop a consensus-based taxonomy.

In response to this research need to further refine the taxonomy, two additional international Delphi studies were conducted (see **Chapter 4**). First, the appropriateness of the original fifty-nine key features was assessed by a panel of international experts. Second, another panel of international experts assessed the categorisation of the key features and their distribution across the domains of the RMIC. Based on the results of all three Delphi studies (the Delphi study described in Chapter 3 and the international Delphi studies presented in Chapter 4), a consensus-based taxonomy was finally developed. The experts indicated that, in order to describe the scope of an integrated primary care effort in practice, person-focused and population-based care principles should be added as two separate domains. This resulted in a final taxonomic structure of twenty-one key features distributed over eight integration domains and organised into three main categories: scope (person-focused vs. population-based), type (clinical, professional, organisational and system) and enablers (functional vs. normative). This taxonomy is uniquely suited for policy, implementation and research purposes in the monitoring and stimulation of integrated primary care development. Further research is needed to develop assessment tools and methods based on the taxonomy that can identify the different perspectives of all the actors involved in integrated care (e.g. patients, professionals, managers, insurers and policymakers).

Part II, consisting of Chapters 5 and 6, explores the development of collaboration processes and their relationship to the degree of integration effectiveness among projects that were part of a national integrated primary care study in The Netherlands. **Chapter 5** describes a longitudinal study of fifty-nine projects that was conducted to gain a better understanding of the collaboration processes and their relationship to the final perceived success at the strategic level. Several interpersonal conditions played a role at the start and in the development of the projects: mutual gains, relationship dynamics, organisational dynamics (shared control) and process management. Mutual gains and process management refer to the acknowledgement of the various interests between partners and the steering of the collaboration process respectively, and both were essential prerequisites to the successfully development of integrated primary care projects. Throughout time, an increase in relationship capital among actors was associated with a successful development of integrated primary care. The results suggested that trust-based collaboration processes (i.e. mutual gains and relational capital) are of more importance than control-based (i.e. process management) processes in the development of integrated primary care projects. These findings are a vital step towards improving the formation and development of integrated care approaches and to achieving their collaborative advantage.

Chapter 6 investigates how changes in collaboration processes over time are related to the perceived degree of integration effectiveness between stakeholders' at the professional,

organisational and system levels. The (dis)similarity of integration mind-sets between stakeholders was used to develop a typology of integrated primary care projects. Forty-two projects were categorised into distinct subgroups based on the perceived degree of integration among stakeholders. Analyses resulted in a 'United Integration Perspectives (UIP)' subgroup, a 'Disunited Integration Perspectives (DIP)' subgroup, and a 'Professional-oriented Integration Perspectives (PIP)' subgroup. Changes in collaboration processes in the subgroups were contrasted over time as well as their final perceived effectiveness among project stakeholders. The projects with an UIP achieved the strongest increase in trust-based (mutual gains and relationship dynamics) and control-based (organisational dynamics and process management) collaboration processes and had the highest overall effectiveness rates among stakeholders. In contrast, projects with a DIP decreased on collaboration processes and had the lowest overall effectiveness rates among all stakeholders. Projects with a PIP increased in control-based collaboration processes (organisational dynamics and process management) and showed the highest effectiveness rates among professionals. These findings highlighted the need for multiple stakeholders to have similar integration mind-sets in order for an integrated care project to be effective. Aligning disunited integration viewpoints requires both trust-based and control-based collaboration conditions. These findings underscore the value of theorizing, evaluating and developing integrated care through a multifocal perspective in order to enhance a more complete understanding of the best way to establish successful integrated primary care projects.

Finally, **Chapter 7**, represents an overview of the main findings, elaborates on the theoretical and methodological considerations of the results presented in this thesis, and discusses the implications for research, policy and practice. The first part of this thesis provides a theory which underpins how integration efforts (clinical, professional, organisational and system) act at different levels (micro, meso and macro) and can be defined from multiple stakeholder perspectives (patients, professionals, managers and policymakers). This theoretical analysis also led to the understanding that both 'hard' functional (e.g. IT, financial incentives) and 'soft' normative (e.g. cultural values) mechanisms are essential enablers for encouraging widespread implementation of integrated care. The second part of this thesis showed that 'normative' collaboration mechanisms at the strategic level clearly influence the development of integrated care. Although the theoretical and empirical findings of this thesis contributed to the unravelling of the concept of integrated care, it remains unclear how integrated care affects the outcomes of care. To bridge this gap and to specify the predetermined endpoints of integrated care, there remains a need to link the current theoretical rationales of the RMIC with health and cost-related outcomes.

Developing integrated primary care is a complex process which involves multiple activities at multiple levels that are not predictable nor linear, but also not chaotic. Without doubt, no magic blueprint exists for the successful organisation of integrated care best suited for all contexts, settings and circumstances. Instead, integrated care is more of an 'art form' founded

on a colourful pallet of values and perceptions arising from different political, organisational, professional and clinical fields. Although this thesis demonstrates that constructive relationships are fundamental to developing integrated care in practice, it is naive to assume that only 'trust' can bind the system together. Relying on normative relational approaches without the proper supporting functional tools and incentives does not seem to be a sustainable solution for the long-term development of integrated care. Grounding integrated primary care will require multiple perspectives that unite in a person-focused as well as population-based and value-driven vision.

SAMENVATTING

SAMENVATTING

Geïntegreerde zorg die is gebaseerd op de kernprincipes van de eerstelijnsgezondheidszorg wordt beschouwd als een belangrijke strategie om de zorg toegankelijk en betaalbaar te houden. Het is echter onduidelijk wat, in de context van de eerstelijnsgezondheidszorg, precies wordt verstaan onder het begrip 'geïntegreerde zorg'. Over de onderliggende samenwerkingsprocessen, die van belang zijn voor het succes of falen van geïntegreerde zorg, is eveneens weinig bekend. Door deze kennislacune worstelen beleidsmakers, financiers, onderzoekers en professionals, met het probleem hoe men geïntegreerde eerstelijnsgezondheidszorg moet stimuleren en evalueren. In dit proefschrift is onderzocht wat geïntegreerde eerstelijnsgezondheidszorg inhoudt en hoe deze zich ontwikkelt, door te focussen op de onderliggende samenwerkingsprocessen. Dit proefschrift bestaat uit twee delen, waarin de volgende centrale onderzoeksvragen worden beantwoord:

1) Wat is geïntegreerde zorg in de context van de eerstelijnsgezondheidszorg?
2) Wat is de rol van samenwerking bij de ontwikkeling van de geïntegreerde eerstelijnsgezondheidszorg?

Het **eerste deel** van dit proefschrift omvat de hoofdstukken 2, 3 en 4 en geeft een theoretische onderbouwing en een operationalisatie van het begrip geïntegreerde zorg in de context van de eerstelijnsgezondheidszorg. In **hoofdstuk 2** wordt het Regenboog Model voor Geïntegreerde Zorg (RMGZ) gepresenteerd, waarin het verband duidelijk wordt gemaakt tussen de theoretische uitgangspunten van de eerstelijnsgezondheidszorg en de geïntegreerde zorg. In de bestaande modellen van geïntegreerde zorg ontbreekt veelal de alomvattende intersectorale systeembenadering met een duidelijke mens- en populatiefocus op gezondheid, terwijl de eerstelijnsgezondheidszorg hierop juist gebaseerd is. Het RMGZ onderscheidt twee sturingsmechanismen van de eerstelijnsgezondheidszorg, te weten mensgerichte en populatiegerichte zorg. Het verbindt deze mechanismen met de zes domeinen van geïntegreerde zorg; klinische, professionele, organisatie, systeem, functionele en normatieve integratie. Het RMGZ laat zien, dat de verschillende integratieprocessen complementaire rollen vervullen op drie niveaus: op het micro niveau van klinische integratie, het meso niveau van professionele en organisatie integratie, en het macro niveau van systeemintegratie. Tevens laat het model zien dat functionele en normatieve integratie randvoorwaarden zijn om de verbinding te realiseren tussen de verschillende niveaus van integratie. Het RMGZ maakt zichtbaar dat geïntegreerde zorg op verschillende niveaus kan worden nagestreefd om een vloeiend proces van zorg voor burgers en populaties te realiseren. Het model biedt een kader, zowel voor een beter inzicht in de onderlinge samenhang van de verschillende domeinen als voor een beter begrip van de complexiteit van geïntegreerde zorg.

Om het RMGZ toepasbaar te maken voor zowel wetenschap als beleid en praktijk, zijn de onderliggende kenmerken van de verschillende geïntegreerde zorgdomeinen uitgewerkt in

een taxonomie. In **hoofdstuk 3** is door middel van een literatuurstudie en een kwalitatieve analyse een conceptuele taxonomie ontwikkeld, bestaande uit negenenvijftig kenmerken die zijn verdeeld over zes integratiedomeinen (klinische, professionele, organisatie, systeem, functionele en normatieve integratie). Met behulp van een Delphi studie onder praktijk- en onderzoeksexperts op het gebied van geïntegreerde eerstelijnszorg in Nederland is bepaald welke kenmerken zij belangrijk achten bij het ontwikkelen van geïntegreerde zorg. De uitkomst van dit onderzoek liet zien dat dit voornamelijk kenmerken zijn die gerelateerd zijn aan klinische, professionele, organisatorische en normatieve domeinen. Functionele en systeemkenmerken werden minder relevant bevonden voor het stimuleren van geïntegreerde zorg. Dit geeft aan dat deze experts, in vergelijking met het theoretische discours, een beperkte visie hebben op het begrip geïntegreerde zorg. De resultaten van de Delphi studie impliceren verder dat meer onderzoek nodig is om een op consensus gebaseerde taxonomie te ontwikkelen.

Hoofdstuk 4 beschrijft twee internationale Delphi studies die tot doel hebben om de conceptuele taxonomie uit hoofdstuk 3 te verfijnen. In de eerste studie heeft een groep internationale experts beoordeeld welke kenmerken geschikt zijn om geïntegreerde zorg in de context van de eerstelijnsgezondheidszorg te stimuleren. In de tweede studie heeft een ander panel, eveneens bestaand uit internationale experts, de specifieke kenmerken binnen de domeinen van het RMGZ geclusterd. Tot slot zijn de uitkomsten van de drie Delphi studies (de Delphi studie uit hoofdstuk 3 en de twee internationale Delphi studies in hoofdstuk 4) gebruikt om een definitieve taxonomie te ontwikkelen. De experts gaven aan dat de mens- en de populatiefocus als twee afzonderlijke integratiedomeinen moeten worden opgenomen, om de reikwijdte van een geïntegreerd zorgproject te kunnen beschrijven. Dit resulteerde in een uiteindelijke taxonomie die bestaat uit eenentwintig kenmerken verdeeld over acht integratiedomeinen, die weer zijn onderverdeeld in drie hoofdcategorieën: reikwijdte (mens- en populatiegericht), type (klinische, professionele, organisatie en systeem) en randvoorwaarden (functioneel en normatief). De resulterende taxonomie kan worden toegepast om initiatieven voor geïntegreerde zorg in de eerstelijnsgezondheidszorg te stimuleren en te monitoren op het gebied van beleid, implementatie en onderzoek. Verder onderzoek is nodig om op basis van deze taxonomie evaluatie-instrumenten en methodes te ontwikkelen die de actorperspectieven van patiënten, professionals, bestuurders en beleidsmakers op geïntegreerde zorg in kaart kunnen brengen.

Het **tweede deel** van dit proefschrift bestaat uit de hoofdstukken 5 en 6. Hierin wordt het onderzoek beschreven naar de relatie tussen het verloop van de samenwerking en de effectiviteit van de integratie. Dit onderzoek maakt deel uit van een nationale studie naar de geïntegreerde eerstelijnsgezondheidszorg in Nederland. In **hoofdstuk vijf** is het onderzoek beschreven naar de relatie tussen de beginsituatie, het verloop van het samenwerkingsproces en het uiteindelijk ervaren succes op strategisch managementniveau bij negenenvijftig geïntegreerde zorgprojecten. Verscheidene interpersoonlijke samenwerkingscondities bleken

een rol te spelen bij de ontwikkeling van de geïntegreerde zorgprojecten: belangen, relaties, proces en organisatie. Dit onderzoek toont aan dat bij de start van een project belangen en proces – dat wil zeggen de mate waarin actoren individuele belangen bespreken en gezamenlijk sturing geven aan het samenwerkingsproces – essentiële condities zijn voor het ervaren succes aan het einde van het project. Het ontwikkelen van sociale relaties tussen de actoren gedurende het proces blijkt een belangrijke voorspellende factor te zijn voor een succesvol ervaren project aan het einde van de studieperiode. Deze resultaten suggereren dat relationele samenwerkingsmechanismen (namelijk belangen en relaties) van groter belang zijn dan beheersmatige samenwerkingsmechanismen (namelijk procesmanagement) bij de ontwikkeling van geïntegreerde eerstelijnsgezondheidszorg projecten. De resultaten laten tevens zien dat het loont om aandacht te besteden aan het samenwerkingsverloop. Door dit verloop nauwkeurig te volgen kan het proces zo nodig tijdig worden bijgestuurd en is de kans op uiteindelijk succes groter.

In **hoofdstuk 6** zijn de veranderingen in het samenwerkingsverloop in relatie tot de effectiviteit van de integratie, vanuit professioneel, bestuurlijk en beleidsmatig perspectief onderzocht. De (on)gelijkheid in integratieperspectieven tussen professionele, bestuurlijke en beleidsmatige stakeholders is gebruikt om een typologie van geïntegreerde zorgprojecten te maken. Tweeënveertig projecten zijn ingedeeld in subgroepen op basis van de mate van integratie zoals ervaren door de stakeholders (professionals, managers en beleidsmakers). Dit resulteerde in een 'Eensgezind Integratie Perspectief (EIP)' subgroep, 'Verdeeld Integratie Perspectief (VIP)' subgroep en een 'Professioneel georiënteerd Integratie Perspectief (PIP)' subgroep. Vervolgens is de relatie onderzocht tussen het verschil in het verloop van de samenwerking en de mate waarin de stakeholders het project als effectief hebben ervaren. Van deze drie subgroepen vertoonden de projecten met een EIP de sterkste verbetering van relationele (belangen en relaties) en beheersmatige (organisatie en proces) samenwerkingsmechanismen en daarnaast hadden zij volgens alle stakeholders de hoogste effectiviteitscores. De projecten met een VIP lieten juist een negatieve tendens in het verloop van de samenwerking zien en zij behaalden volgens alle stakeholders de laagste effectiviteitscores. De projecten met een PIP vertoonden vooral een verbetering van beheersmatige samenwerkingsmechanismen (organisatie en proces) en zij hadden volgens de professionals de hoogste effectiviteitscores. Dit resultaat impliceert dat draagvlak onder de verschillende stakeholders noodzakelijk is voor het effectief ontwikkelen van geïntegreerde zorg in de praktijk en dat relationele en beheersmatige samenwerkingsmechanismen van belang zijn om ongelijke perspectieven van stakeholders te overbruggen. Een benadering vanuit verschillende perspectieven is van belang om grip te krijgen op de complexiteit van geïntegreerde zorgprojecten in de praktijk.

In **hoofdstuk 7** ten slotte is een korte samenvatting van de belangrijkste bevindingen gegeven, is ingegaan op de theoretische en methodologische overwegingen van de studies in dit proefschrift en zijn de implicaties bediscussieerd voor onderzoek, beleid en praktijk.

Het eerste deel van dit proefschrift geeft een theoretische onderbouwing voor het definiëren van integratieprocessen (klinisch, professioneel, organisatie en systeem) op verschillende niveaus (micro, meso en macro) en vanuit verschillende stakeholdersperspectieven (patiënt, professional, bestuurder en beleidsmaker). De theoretische analyse laat ook zien, dat zowel 'harde' functionele als 'zachte' normatieve integratiemechanismen van belang zijn om de geïntegreerde zorg in de praktijk te implementeren. Het tweede deel van het proefschrift maakt duidelijk dat 'normatieve' samenwerkingscondities op strategisch niveau de ontwikkeling van geïntegreerde eerstelijnsgezondheidszorg beïnvloeden.

Hoewel door middel van de theoretische en empirische bevindingen van dit onderzoek het begrip geïntegreerde zorg is ontrafeld, blijft het onduidelijk wat de invloed is van geïntegreerde zorg op de uitkomsten voor patiënten. Verder onderzoek is nodig om de theoretische uitgangspunten van het RMGZ te verbinden met uitkomstmaten als ervaren kwaliteit van zorg, gezondheid en kosten. Samenvattend kan gesteld worden, dat het ontwikkelen van geïntegreerde zorg in de context van de eerstelijnsgezondheidszorg een complex proces is; waarbij meerdere activiteiten op verschillende niveaus niet voorspelbaar of lineair zijn, maar ook niet volledig als een chaotisch proces verlopen. Dit betekent dat er geen standaardrecept is voor het succesvol organiseren van geïntegreerde eerstelijnszorg in landen, regio's of wijken. Het is meer een kunst, die bestaat uit het samenbrengen van een kleurrijk palet van normen, waarden en percepties; voortkomend uit verschillende politieke, organisatorische, professionele en klinische achtergronden. In dit promotieonderzoek is aangetoond dat constructieve samenwerkingsrelaties van essentieel belang zijn voor het ontwikkelen van geïntegreerde zorg in de praktijk. Het is echter naïef te veronderstellen, dat enkel normatieve relationele mechanismen de verschillende actoren bij elkaar zullen brengen. Het ontwikkelen van geïntegreerde eerstelijnsgezondheidszorg zonder de juiste functionele ondersteuningsmechanismen zal op de lange termijn geen duurzame oplossing zijn. Om de geïntegreerde eerstelijnsgezondheidszorg volledig tot zijn recht te laten komen, is een multi-perspectief benadering nodig; mensgericht, populatiegericht en waarde-gedreven in de breedste zin van het woord.

DANKWOORD

DANKWOORD

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Pim Valentijn, september 2015

ABOUT THE AUTHOR

Pim Valentijn was born in Enschede, The Netherlands, on June 13, 1982. He received his secondary education (Atheneum) at the Nassau Veluwe College in Harderwijk and graduated in 2002. He then studied physiotherapy at the HU University of Applied Sciences in Utrecht, where he graduated in 2007 after writing a bachelor's thesis on the role of physiotherapeutic interventions for people with obesity. Soon afterwards, Pim started working as a physiotherapist in several primary care practices and initiated further academic pursuits in the department of Health Sciences at the VU University in Amsterdam. After finishing his master's thesis on the implementation of eHealth applications within primary and secondary care settings, he received his Master of Science in Policy and Organisation of Health Care in 2010. From that moment, his interest in complex implementation processes and scientific research was piqued, which he pursued as a researcher at the Jan van Es Institute, the Netherlands Experts Centre of Integrated Primary Care. Soon thereafter, Pim started his Ph.D. at the Scientific Centre for Care and Welfare (Tranzo) at Tilburg University. His research into integrated primary care was performed under the supervision of Professor Vrijhoef, Professor Ruwaard and Dr. Bruijnzeels. The current dissertation is the result of this four-year undertaking, and this project resulted in several publications in international academic journals. In 2014, the International Foundation for Integrated Care (IFIC) awarded Pim its Integrated Care Award, acknowledging his publication about the Rainbow Model of Integrated Care for its outstanding contribution to the science and practice of integrated care. In his future research, Pim hopes to further implement value-based integrated care strategies and contribute to the improvement of scientific evaluation methods.